

**Dental**

**Abstracts**

*a selection of world dental literature*

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**Abstracts**

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AMERICAN DENTAL ASSOCIATION

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has  
these  
purposes**

1. *To present a selection of pertinent literature representative of all points of view within the profession;*
2. *To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and*
3. *To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.*

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*The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.*





Figure 1 Left: New pattern for upper teeth.  
Right: New pattern establishing locked grip



Figure 2 New pattern. Method of application to lower molar

## Oral surgery



### Extractions

## A new design of dental forceps blade

P. A. Trotter. *Brit.D.J.* 102:224-226  
March 19, 1957

Most dental forceps have blades that are hollowed out on their inner surface, the concavity being scored or rifled to facilitate gripping the surface of the root. The blades vary in width and the concavity may be an arc of any reasonable dimension. In many instances there is not a close fit of the forcep blade to the root, and the blade slips on the tooth during its removal. The slipping is more likely to occur with a broken-down tooth, particularly when the deficiency is on the lingual aspect of the lower teeth and the upper teeth.

With resistant molars and upper and lower cuspids, the forceps will tend to ride on the root surface.

Another shortcoming of the usual dental forceps is that the blade is designed to apply to one root only of a multirooted tooth.

A new design of forceps blade has been conceived with a universal pattern which adapts itself to root contours of various dimensions. Roots of different sizes and shapes can be gripped firmly by the forged end of the blade. Teeth of all dimensions can be locked firmly in its beaks.

On mandibular molars the forceps are applied to the anterior or posterior root. In most instances the appropriate beaks act in the nature of a hawk's bill, and slide into the bifurcation, thus enhancing the hold on the tooth. For upper molars the forceps are applied to the lingual and one buccal root, and one of the points on the buccal side fits into the bifurcation. If the roots are closely placed, the forceps are used as in gripping a single rooted tooth.

The new forceps have been used by students and staff in the extraction department of the King's College Hospital Dental School over a



Figure 3 New pattern. Method of application to upper molar

period of three years. They have been tried at other hospitals and clinics and by private practitioners. They have come through the clinical trials well and appear to be a practical instrument.

*King's College Hospital Dental School, University of London, London, England*

**Control of hemorrhages occurring after tooth extraction**  
(Zur Therapie der Nachblutung post extractionem)

P. Hauser. *Zahnärztl. Welt & Reform* 58:385-387 July 25, 1957

The best way to combat hemorrhage after tooth extraction is to prevent it. If symptoms are present which indicate that systemic diseases may induce hemorrhage, such patients should be hospitalized before tooth extractions are performed. Patients in whom the bleeding time appears to be abnormally prolonged should be given calcium lactate (4 Gm. daily) for three days prior to and following tooth extractions.

Treatment and control of hemorrhage after tooth extraction demand special attention.

At the oral surgical department of the Dental Institute of the University of Frankfurt/Main, Germany, secondary hemorrhages occurring after complicated or multiple tooth extractions are con-

trolled and treated in the following manner: (1) oxidized cellulose and fibrin or absorbable gelatin sponge are compressed into conical form and placed into the alveoli; (2) firmly folded gauze sponges are placed over the sockets before the foam becomes expanded; (3) firm biting pressure is exerted for ten minutes without jaw movement; (4) alginic acid powder is placed on the sponges if bleeding still persists, and the biting pressure is repeated; (5) tampons with hemostatics (the German brands "Sangostop" or "Clauden") or thrombin, either as a powder or dissolved in isotonic sodium chloride solution, are applied; (6) epinephrine in dilutions of from 1:25,000 to 1:100,000 is injected in combination with a local anesthetic, and (7) a long-lasting barbiturate is administered for psychologic effect.

No drug exists which by oral administration accelerates the coagulation of normal blood. Any drug taken orally, therefore, can have only a psychologic effect.

In the majority of patients treated, hemorrhage even from major vessels was arrested, and no unfavorable reactions were observed.

If hemophilia was present, repeated transfusions of fresh blood preoperatively brought the bleeding and clotting time to normal levels.

*Ludwig Rehn Strasse 14, Frankfurt/Main, Germany*

**Bacteremia after tooth extraction**  
(Zur Frage der Bakteriämie nach Zahnextraktion)  
E. Lautenbach and G. Linzenmeier.

*Deut.zahnärztl.Zschr.* 12:980-992 July 15, 1957

Bacteremia, the presence of pathogenic bacteria in the circulating blood stream, occurs far more frequently after tooth extraction than has been reported in dental and medical literature.

The blood stream generally has the ability, within certain limits, to sterilize itself and, because of the antibody reaction in the human organisms, it can protect itself against invading microorganisms mainly by autoagglutination of the bacterial incitants.

At the Dental Clinic and the Institute for Public Hygiene of the University of Bonn, Germany, 104 patients were recently examined

in whom bacteremia was definitely established after routine tooth extractions under local anesthesia.

Blood cultures were taken five minutes after tooth extraction. In the majority of instances, nonhemolytic ("green") streptococci were isolated; in three instances *Str. pyogenes* (Group F), and in one instance diplococci. Frequently anaerobes of various species were established, sometimes in mixed cultures with aerobes. It can be assumed that all bacterial constituents of the oral flora participate in the development of bacteremia after tooth extractions.

The occurrence of bacteremia after tooth extraction has no relation to the condition of the gingiva or to the patient's general health with regard to dental focal infection.

Besides tooth extraction, there are often other factors present which may promote bacterial penetration into the blood stream. These factors can be classified as enzymic actions, defective collagenase actions or epithelial defects.

Because it was impossible to predict which blood cultures, taken from patients immediately after tooth extraction, would be positive, further investigation will be carried out to establish the importance of the findings not only on the incidence of bacteremia after tooth extraction but also on the pathogenesis of certain oral diseases and on the evaluation of antibiotic treatment methods.

Koblenzerstrasse 100/104, Bonn, Germany



### Surgical technics

#### Unilateral hyperplasia of the mandible

C. J. Dreyer. *J.D.A.South Africa* 12:199-205  
June 1957

A 19 year old European girl complained of asymmetry of the face. The asymmetry had first been noticed at the time her menstrual periods started, at the age of 12 or 13 years. The deformity had increased during the next five or six years, and then remained static for the year preceding the examination.

Her head was inclined to the right. The bones of the upper part of the face on the left side, especially the supraorbital ridge and zygomatic process, appeared to be enlarged. There was a pronounced deviation of the mandible to the right side. The whole left side of the body appeared to be slightly larger than the right, and a mild degree of scoliosis was evident. The mandible, in the closed position, deviated to the right. On opening, the mandible swung back to the left until the center line proximated the mid-sagittal plane. Tomograms of the temporomandibular joints showed that the left condyle had little sliding movement and predominantly a hinge movement, whereas the right condyle had a pronounced sliding movement during opening. The left condyle was larger than the right. The left foot was enlarged. The apparent enlargement of the left facial bones and body, together with the scoliosis, indicated total or limited hemihypertrophy. The skeletal investigation did not concur with this diagnosis.

The operative procedure was as follows: The mandibular position was predetermined. Metal cap splints carrying the necessary hooks were constructed and cemented the day prior to the operation. Antibiotics were administered preoperatively and postoperatively as a preventive measure. Bilateral osteotomy (extraoral approach) was performed under general anesthesia. The posterior border of the left mandible was trimmed to prevent impingement on the mastoid process during opening. Immobilization was effected for five weeks by means of elastic traction.

Function was introduced without elastics but with the splints still in position, for one week. The cap splints were removed, the cusps ground and the bite equilibrated. The latter procedure was continued at weekly intervals for three weeks. The patient was advised to have the maxillary left cuspid extracted and a new partial denture constructed, but she preferred to retain all her remaining teeth. The patient was re-examined ten months after the operation. The contour of her face had improved, the occlusion had been maintained and the operation scars had become practically invisible.

The history of this patient indicates that the active growth period of the left condyle had

begun some time before the age of 13 years and had been quiescent for the past year. The excessive condylar growth had been translated into a forward growth of the body of the mandible to the extent of 18 mm. This in turn had a rotational effect on the right condyle. Since no temporomandibular joint disturbances were present, the right joint obviously accommodated itself while its condyle was rotating.

*University of the Witwatersrand, Johannesburg, South Africa*

**Preventive elimination of the dental germs of third molars** (La germectomie prophylactique de la dent de sagesse)

M. A. Boucher. *J.dent.belg.* 48:7-17  
Jan.-Feb. 1957

An examination of 500 reports of impacted third molars revealed a gradual increase in severe complications associated with this anomaly. There were 40 instances of osteomyelitis, 35 of cellulosis and acute streptococcic infection (Ludwig's angina), 8 of cavernous sinus thrombosis, 46 of jaw fractures in the molar region (13 caused by external trauma, 21 by tooth extractions and 12 by pathologic factors), 42 of cysts in the oral cavity, and 41 accidents during dental treatments in which the third molar was pushed into the soft tissues. In 68 other instances, there were severe postoperative complications causing the death of 38 patients.

It seems obvious that these complications must constitute a problem for oral surgeons.

During the last ten years, at the clinic of the Dental College in Paris, the dental germs of third molars were eliminated successfully in patients from 13 to 16 years old. The French call this operation "germectomy."

Germectomy was utilized only after a careful diagnosis and evaluation of the probable or possible disadvantages or inconveniences which this surgical intervention could produce. Clinical experience proved that in all instances in which germectomy was indicated, the advantages by far exceeded the disadvantages.

Although many parents, and even some dentists, were opposed to germectomy in seemingly healthy children, they changed their minds after

they were informed that serious complications frequently associated with impacted third molars may develop when the patients reach adulthood.

Germectomy can be performed quickly and easily. The actual removal of the dental germ of a third molar requires only two minutes.

This surgical procedure, in execution and sequence, contrasts favorably with surgical removal of third molars after the crowns are formed or of teeth deeply impacted and buried with horizontally placed curving roots.

In germectomy, postoperative trauma seldom occurs, and the majority of patients will benefit by elimination of the dental germs of third molars at a time when the bone is soft, the healing quick, and the danger of postoperative infection negligible.

*L'École Odontologique de Paris, Paris 6, France*

**Treatment methods in ankylosis of the temporomandibular joint**

(Quelques conclusions concernant les principes et les méthodes de traitement dans l'ankylose temporo-mandibulaire)

Valerian Popesco. *Rev.franç.odontostomat.*  
3:1073-1088 Nov. 1956

At the Dental Clinic of the University of Bucharest, Romania, 41 patients with different types of ankylosis of the temporomandibular joint were treated successfully with a comparatively new method.

Clinical experience indicated in the majority of instances that a new joint should be created to replace, as nearly as possible, the abnormally immobile joint. Implantation of acrylic disks met with failure, but the insertion of acrylic condyles obtained an anatomic restoration with satisfactory height of the ascending ramus.

To correct malformations of the temporomandibular joint resulting from ankylosis occurring in childhood, the following surgical procedures were carried out: (1) the mandibular height was restored by insertion of an acrylic condyle; the correction was accomplished by serial interventions; (2) the necessary lengthening of the ascending ramus was obtained by vertical osteotomy beginning at the sigmoid

notch, and (3) extraoral and intraoral defects were corrected by autoplasmic transplantation of osseous tissue or insertion of an acrylic implant in the outline of the mandible, preferably on its concave side.

In the majority of instances, two weeks after the operation, the patients were discharged. Recovery was uneventful. The patients were seen postoperatively at six month intervals, and there was no evidence of complication or recurrence.

*Clinique de Chirurgie bucco-maxillo-faciale, Bucharest, Romania*

#### **An experimental and clinical evaluation of autogenous dermal grafts used in the treatment of temporomandibular joint ankylosis**

N. Georgiade, F. Altany and K. Pickrell.  
*Plast. & Reconstr. Surg.* 19:321-336 April 1957

Numerous surgical procedures have been proposed to correct temporomandibular joint ankylosis. A new treatment is described. The operative technic was developed on an experimental basis; experimental results on three dogs and three rhesus monkeys were so uniformly successful that a complete clinical evaluation was considered justified. The new operative procedure has been used in treating eight patients with ankylosis of the temporomandibular joint, with excellent cosmetic and functional results.

The procedure utilizes an autogenous dermal graft interposed between the newly cut and contoured bone edges of the condyle.

An inverted hockey stick type of incision is made in the preauricular region with a 1 cm. curved extension of the incision over the zygomatic arch. A linear incision is then made through the parotid fascia, and the parotid gland is reflected medially. The superior branches of the facial nerve are identified and retracted medially. The region of ankylosis is exposed, and a contoured section of ankylosed condyle 0.5 cm. wide is resected with chisels and rongeur forceps through to the coronoid notch with subsequent release of the ankylosis.

A split-thickness skin graft 0.014 inch thick is reflected in the thigh region but not detached.

The underlying dermis is taken as a free graft. The split-thickness skin graft is reapplied in its original position and maintained with a number of no. 00000 black silk sutures and then dressed.

Two small openings are made about 0.5 cm. below the region of resection at each corner of the newly contoured condyle. The dermal graft is sutured in an umbrella fashion over the inferior portion of the contoured condyle in the newly created jointed space. The graft is maintained in position by means of two small 32 gauge stainless steel wires threaded through the newly created openings and attached to the graft along its margins as it overlaps the bony edges. Chromic catgut sutures (no. 0) were also used in two patients in lieu of the stainless steel wires, with equally good results. The operative regions are closed with no. 0000 white silk sutures subcutaneously, and no. 000000 black silk sutures are used to approximate the skin edges.

Motion in the mandible is initiated gradually on the first postoperative day and maintained throughout convalescence. A regular diet is instituted after the first postoperative day.

The closer to the anatomic temporomandibular joint the operative procedure is performed, the better the mandibular movements are likely to be. The insertion of an autogenous dermal graft in a newly created joint space produces a meniscuslike tissue with a resultant new physiologic mandibular joint.

*Duke University Hospital, Durham, N.C.*



#### **Anesthesia and analgesia**

#### **When the patient feels pain . . .**

G. Fitzgerald. *Maclean's Magazine* 42:61-65  
May 25, 1957

Why does toothache reduce a seemingly healthy man to whimpering self-pity, whereas a weaker person may endure pain for a long time without complaint? Why do some patients take exaggerated precautions to avoid pain whereas others seem to welcome physical sufferings?



The only safe answer to these questions is that pain is as variable as human nature. Although each person interprets pain individually, all share certain body mechanisms that trigger the sensation of pain in the nervous system. If a pin penetrates the skin, electric impulses sweep along nerve fibers and up the spinal column to the brain. When these signals reach the thalamus, pain is felt. When they reach the cerebral cortex, pain develops emotional overtones. After the initial sharp and localized pain sensation, a duller, more diffuse sensation is felt, the result of impulses traveling more slowly.

All persons have approximately the same threshold of pain, regardless of age, sex, race, emotional state or fatigue.

By testing thousands of subjects with the dolorimeter, a pain-measuring instrument, it was established that most persons feel pain when their skin temperature is raised about 30° C.

Similar experiments have indicated that the threshold of pain varies considerably at different times. During menstruation, women often experience a lowering of the pain threshold due to general discomfort and increased irritability.

Physical pain is not a simple condition of an impulse traveling at a fixed rate along a nerve. It is the result of the conflict between an introduced stimulus and the entire organism.

Current treatment of pain in dental and medical practice takes full account of the mental elements. Physicians and dentists know that minor pain that patients normally encounter and often disregard may swell out of all proportion when accompanied by emotional disturbances. Patients leading happy and active lives usually tolerate pain more easily than those who are lonely or depressed.

Suggestion often has an even stronger effect than drugs. Subjects who were led to believe that they had taken a pain-killing drug, whereas in fact a placebo had been administered, had their threshold of pain raised about 90 per cent.

Suggestion, however, also can be used to produce pain. If a subject under hypnosis is told that he will be hurt, and he is touched with a dull pencil, he feels actual pain.

Dentists who say, "Your pain is in your mind only," lose the confidence of patients who know that pain is present because they can feel it.

Pain-relieving drugs, used in dental practice, range from aspirin to powerful narcotics such as codeine, morphine and meperidine hydrochloride. Although narcotics carry a heavy addiction risk, no other drugs work so well against pain.

Local anesthetics such as butacaine sulfate, butethamine hydrochloride, chlorobutanol, cocaine hydrochloride, lidocaine hydrochloride, procaine hydrochloride or tetracaine hydrochloride are used mainly to block nerve pathways and to infiltrate tissues causing pain.

Surgery frequently is used to cut nerve fibers that carry the pain sensation to the brain.

New psychologic technics are used to free patients from anxiety and to build up their emotional resistance to pain.

Science, however, is still far from conquering or even comprehending pain. The attempts of dentists and physicians to fight pain are like trying to dam a river that arises from nowhere, renews itself indefinitely and reappears whenever its channels are blocked. No matter what the intensity of pain is, it always is an urgent, dynamic force that leaves the patient damaged to some degree.

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### **Hypnoanesthesia in dental practice**

(Ipnoanestesia negli interventi stomatologici)

B. Zelent. *Rass.trim.odont.*, Milan 38:406-414

April-June 1957

More than 100 years ago, about 300 major operations, including removal of facial and oral tumors, were performed under anesthesia induced by hypnosis. In the reports describing these surgical interventions, it was emphasized that neither pain nor discomfort was experienced by the patients, and that no postoperative complications due to hypnotic anesthesia were observed. At that time, the method was called "hypnonarcosis."

With the introduction of drug anesthesia, however, hypnotic anesthesia was discarded by dental and medical practitioners and surgeons.

Because of lack of knowledge and experience in the field of hypnotism, and also because only a few dentists and physicians have been trained adequately in psychosomatics, any hypnotic

phenomenon still appears to be a mystery. If the large number of cases in which hypnoanesthesia has been used were reported to both professions, much of the persisting prejudice against the use of hypnosis would be eliminated.

It is known that the individual threshold of pain can be varied by suggestion, the patient's attitude toward the dentist or physician, or by distraction. When the patient is in the hypnotic state, suggestions become more effective, the subject's attitude can be changed easily, and distraction, in the form of hallucination, can be induced.

At the dental clinic of the University of Pavia, Italy, 15 oral surgical procedures were carried out under hypnoanesthesia. The complete success obtained in all 15 instances should not lead to overenthusiasm and overselling of hypnoanesthesia to the dental profession. All the dynamics of the hypnotic phenomena still are not completely determined and evaluated. This is no reason for condemning the use of hypnoanesthesia in dental practice, however, because the mechanics of many other methods which were readily accepted are also not fully known and understood.

Hypnosis can no longer be regarded as a mysterious method. It is an artificially induced trance (or sleep) produced by a normal, intelligent and skilled practitioner in a normal, intelligent and cooperative patient. With this in mind, hypnoanesthesia should be considered not as a new panacea in dentistry but as a scientific method which, at least, merits recognition and research.

*Clinica Odontoiatrica, Università di Pavia, Italy*

#### **Prevention of complications in local anesthesia**

J. R. Hayward. *North-West Den.* 36:153-158  
May 1957

With more than 55,000,000 administrations of local anesthetics by the dental profession annually, it is understandable that a few untoward reactions and abuses may occur. Complications and accidents may stem from errors in the administration of local anesthetics, and unusual systemic reactions may occur.

The systemic reactions to local anesthesia can be prevented by making a habit of taking a short patient history, utilizing psychic sedation and appropriate premedication, and employing refinements of safety in the selection of anesthetic agents and in injection technics. When an untoward reaction to an injection becomes manifest, quick appraisal and prompt institution of measures of counteraction will neutralize complications effectively.

For a safe and painless injection, a few precautions must be observed. Departures from aseptic technic always carry a penalty. Absolute sterility of needles, syringes and solutions, combined with injections made into a dry mucosal surface prepared by antiseptics will minimize the hazard of infection.

The use of sharp, new needles reduces the hazard of breakage. Small barbs may be detected just before injection by drawing and rotating the tip of the needle across sterile mesh gauze; any turned point will snag on the gauze. For infiltrations, a no. 27 or no. 28 gauge needle should be used; for deep block injections, a no. 25 gauge needle 1½ inches long. If the mucosa is placed under tension and the tissue displaced into the needle with the initial insertion, the stimulus of the penetration is minimized. Slow injection should begin instantly when the mucosa is penetrated and should continue in advance of the needle. A smooth, steady injection at a slow rate will avoid the pressure pain of rapid tissue distention. Digital pressure over areas of dense tissue, such as the palatal mucosa, will reduce injection discomfort.

Some factors that may precipitate fainting reactions in vulnerable patients include: sight of instruments and syringes, overheated operating room, episodes of pain, a background of organic disease, disturbed metabolism, hypoglycemia from lack of food, lack of confidence in the operator, and fear of an unpleasant situation. The operator can reduce many psychologic barriers by eliminating unpleasantness in his surroundings and employing a calm, gentle and reserved manner. A physical barrier to the fainting reaction is readily achieved by placing the patient in a supine, horizontal position in the chair.

*Department of Oral Surgery, University of Michigan, Ann Arbor, Mich.*

▼  
Roentgenology

**Technics used in dental teleroentgenography**  
(Die aufnahmetechnischen Bedingungen der Fernröntgenaufnahme)

Erich Hausser. *Acta CMF* 1:50-62, 1957

In taking profile teleroentgenograms which are suitable for the measurement and comparative evaluation necessary for orthodontic diagnosis and treatment planning, a sufficiently great distance between the object (target) and the film must be selected to avoid distortions due to projection.

The degree of inclination of tracings which are oblique to the film at a distance of about 4 meters amounts to 2 per cent. The power of the customary dental x-ray machine is insufficient for such a large target-film distance. The power of larger type x-ray machines, however, is sufficient for most teleroentgenographic exposures.

At a considerable distance, the size of the focus area has hardly any effect on the sharpness of teleroentgenograms. To avoid roentgen-ray dispersion, however, the use of exact screenings is recommended.

When ultrasensitive films with the highest possible contrast effects are used, the most favorable results are obtainable with the "Sinegran-Rubra" or the "Saphir" reinforced screens.

The time of exposure in dental teleroentgenography varies between one and three seconds, 100 kilovolts and 55 milliamperes. Blurred margins usually caused by movements are avoided. The softer tissues appear clearly represented if the normally developed film undergoes a chemical reduction.

The patient's head must be placed in a position which permits keeping the film and the median sagittal plane at a level perpendicular to the central roentgen-ray beam. The head rest, specially designed by Korkhaus for this purpose, provides the possibility for correct positioning of the head also in instances of asymmetry of the facial skeleton.

Martinistrasse 52, Hamburg 20, Germany

**Cephalometrics in the atomic age**

Melvin I. Cohen and Eric Hammond.  
*Am.J.Orthodont.* 43:592-597 Aug. 1957

The National Academy of Sciences has recommended that "the medical use of x-rays should be reduced as much as is consistent with medical necessity." This precaution is the considered conclusion of 100 able scientists who had weighed all the available evidence. A simple method of reducing the amount of radiation in the routine use of cephalometric roentgenography is described.

The useful beam of roentgen rays emerging from the tube may be cut down or limited at or near the source by a primary diaphragm, or near the patient by a secondary diaphragm. The primary diaphragm has the important advantage of offering increased protection to the operator, and of being smaller. It requires more accurate positioning and centering. The secondary diaphragm has to be larger, more cumbersome, and offers no protection to the operator.

A primary diaphragm can be constructed of lead, preferably 2 mm. thick. The desired area of coverage can be selected. For routine cephalometrics, a rectangle bounded approximately by the soft tissue of the nose and chin anteriorly and inferiorly, the Bolton point posteriorly, and about two inches above nasion superiorly should be adequate.

If a lead limiting diaphragm has been inserted by the manufacturer in the housing in front of the tube, the desired aperture in the new limiting diaphragm may be calculated by the following formula:

$$\text{New aperture} = \frac{\text{size of existing aperture} \times \text{desired area}}{\text{area of film shadow}}$$

Where there is no limiting diaphragm, the aperture best can be determined by trial and error. A lead washer 2 mm. thick is cut to fit accurately the housing attached to the fixator. A washer cutter attached to a hand drill, or a sharp knife and file, can be used. A hole about 1/4 inch in diameter is cut in the center of the washer, and the washer is positioned. A film is exposed, and the area covered by this aperture is measured.



To construct the secondary diaphragm, lead sheeting 1 mm. thick is secured in a suitable frame and attached to the head holder. The lead can be secured between two sheets of Masonite 3 mm. thick. A 7.5 inch post is cut in a strategic position to allow for the inclusion on film of all the pertinent structures for a routine evaluation. This size is calculated to include these structures in larger patients.

When the described diaphragms were used, with a General Electric machine operated at 90 kilovolt peak and 15 milliamperes for 0.3 second, 0.03 r was measured.

Harvard School of Dental Medicine, Boston, Mass.



#### Fractures

#### Stabilization without surgical intervention in fractures of the upper jaw

(Fixation des fractures des maxillaires sans intervention chirurgicale)

W. Zuellig. *Rev.mens.suisse odont.* 67:538-547  
June 1957

Fractures of the upper jaw present problems of stabilization far more complicated than fractures of the lower jaw and also carry greater risks of subsequent facial deformities.

Fortunately, fractures of the upper jaw occur less frequently than fractures of the lower jaw. Clinical experience obtained at the dental clinic of the Municipal Hospital of Lugano, Switzerland, has established a ratio of about one maxillary fracture to five mandibular fractures.

The department of oral surgery of the clinic in Lugano employs an extraoral method to obtain stabilization without surgery in instances of simple, compound or comminuted fractures of the upper jaw.

This method has certain similarities to the Roger Anderson technic, and can be applied successfully even ten days or more after the injury.

The fragments are extraorally stabilized with two screw-bearing pivots which are placed

through the interproximal spaces of teeth which are not lying directly in the fracture line. These pivots are connected with a cast splint made of a cobalt-chromium-molybdenum alloy. The fragments become completely immobilized when the splint is connected to several loops made of stainless steel.

An alginate impression is taken with the pivots in position. If necessary, the pivots later can be repositioned on the model.

A splint is formed in an acrylic pattern and then cast in the customary manner.

With this inexpensive appliance, the fractured upper jaw is brought into a normal—or even an improved—anatomic and functional relationship, and kept stabilized until union has taken place.

This method makes it possible for the patient to return to work quickly and to keep his mouth in a healthy condition, thereby reducing the danger of infection, and permits him to eat a fairly normal diet.

Via Pretorio 2, Lugano, Switzerland



#### Plantation

#### Dental implants in theory and practice

Boris Trainin. *Brit.D.J.* 102:389-398  
May 21, 1957

The implant denture is especially indicated for patients unable for psychological reasons to tolerate conventional dentures or bridges. Successful subperiosteal implants have been *in situ* for eight years. With experienced operators the incidence of successful mandibular implantation is now probably near 100 per cent.

Since the bone of the maxilla is cancellous, the long-term prospects of maxillary implants inevitably are less favorable than those of the mandible. New maxillary implant designs, however, utilizing the bone of the hard palate for load bearing, offer far greater prospects of success than the early horseshoe-shaped implants. Even now, however, maxillary implants are still considered to be in the developmental stage.

Responsibility for the success of an implant denture is shared by the operator and the patient. Periodic inspections are imperative for adjustment to the occlusion, scaling of the abutments, roentgenographic examination, and a check on oral hygiene. The patient must be prepared to follow the prescribed brushing routine faithfully and to come for examination at regular intervals.

Subperiosteal implants offer a degree of comfort, security and biting power unrivaled by any conventional denture. As in the natural dentition, all pressure is transmitted directly to the bone, leaving the mucous membrane free. Moreover, since the implant is housed within living tissue, it seems to be accepted by the patient as an integral part of the body. The fear most commonly expressed by those who have never seen an implant is that infective organisms will penetrate between the gingival trough and abutment post and cause osteomyelitis, cellulitis or septicemia. Yet no instance of systemic disorder or of serious pathologic condition in the local tissues has been reported as a result of dental implantation, although it is conservatively estimated that 1,500 implant dentures have been inserted during the past eight years.

109, Harley Street, London, W.1, England



#### Miscellaneous

#### **The examination of imperfect speech following cleft-palate operations**

Wilfred Hynes. *Brit.J.Plast.Surg.* 10:114-121  
July 1957

A simple, standard method of testing speech after cleft palate operations is described. It requires no detailed knowledge of speech therapy and no special apparatus; therefore, it can be used by the surgeon himself in his follow-up clinic. It is quick and simple. It provides a standard so that results from one clinic can be compared with those from another. It demonstrates speech faults and locates the structure responsible for them.

The examination is made of the following: (1)

the palatopharyngeal region, (2) the tongue movements and (3) the intelligence, hearing and vision.

1. Examination of the palatopharyngeal region. Inspection as the patient says "ah" will demonstrate the length, mobility and condition of the palate and the size and mobility of the oropharynx. Severe abnormalities of these structures will be obvious but the examiner must be cautious in his assessment of less severe defects.

Nasal escape and nasal grimace vary in degree with the different consonants but are most obvious when saying "s." The patient therefore is asked to say "sing a song of sixpence," which will demonstrate nasal escape if it exists.

Nasal speech is due to nasalized vowels and is most obvious in the vowel "ee." The patient therefore is asked to say "Peter paid a green fee," which will demonstrate nasal tone if it is present.

Special tests include the carnival blower test, the mirror test, and nipping the nostrils between finger and thumb to see if this improves speech.

2. Examination of the tongue. The tongue is involved in the production of 18 vowel sounds and 14 consonants. It produces these by rising at its tip, in its central third, or at its base. Only the base and the tip of the tongue are tested. The patient is asked to produce the sounds "kah," "gah" and "ah-ay-ah" to determine if the base of the tongue rises correctly, and "lah," "tah" and "dah" to see if the tip rises correctly. It is quite easy to articulate the syllables "lah," "tah," "dah," "kah" and "gah" with the mouth wide open, and the patient should be asked to do this; an excellent view of the movement of the tongue is then obtained.

3. Examination of the intelligence, hearing and vision. Mental retardation as the cause of defective speech after cleft palate operations has been overstressed. Many patients have been labeled mentally dull whose imperfect speech is due to a tongue that moves incorrectly. Similarly, undetected deafness or visual disturbance can cause behavior and speech which are considered to be the result of stupidity. Detection and treatment of these disturbances and intelligent speech therapy can produce an unexpected improvement in the speech of these patients.

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## Operative dentistry



## Rehabilitation or equilibration

### The use of the bite plate as a preresorative measure

Stanley D. Tylman. *J.Canad.D.A.* 23:134-140  
March 1957

If the patient exhibits an overclosure of the vertical dimension with accompanying local dental tissue involvements and temporomandibular disturbances, the dentist must decide whether to re-establish the vertical height immediately with restorations or whether a pre-restorative treatment should be used. If the latter, then the bite plate may be utilized.

The use of the bite plate is not new. It has been used by the orthodontist and periodontist. Its adaptation as an adjunct in the treatment of partially edentulous patients is comparatively recent.

When a tooth becomes functionless, because of the loss of its occluding opposing tooth, it egresses from its former plane of occlusion. This change does not take place by the tooth erupting out of its socket as it does when it is worn down by normal attrition. This movement, up or down, depending on whether it is a lower or upper tooth, is accompanied by the movement of the entire periodontium—the gingivae, the periodontal membrane and the lamina dura. Also a change occurs in the supporting bone trabeculae. This mass movement continues until the tooth meets an opposing stop, usually an opposing tilted or rotated tooth. If no opposition is encountered, the tooth may egress to the extent that it touches the mucosa of the opposing edentulous ridge.

The bite plate is utilized to assist biologically in the establishment of the desired vertical height. To take teeth out of function permanently would not only cause them to egress, but would cause harmful changes in their supporting and contiguous tissues; the width of the periodontal membrane would decrease and the supporting alveolar bone gradually would be diminished in form and size, causing an increase in the size of the marrow spaces. This is not desirable. Although it is recommended that the patient wear

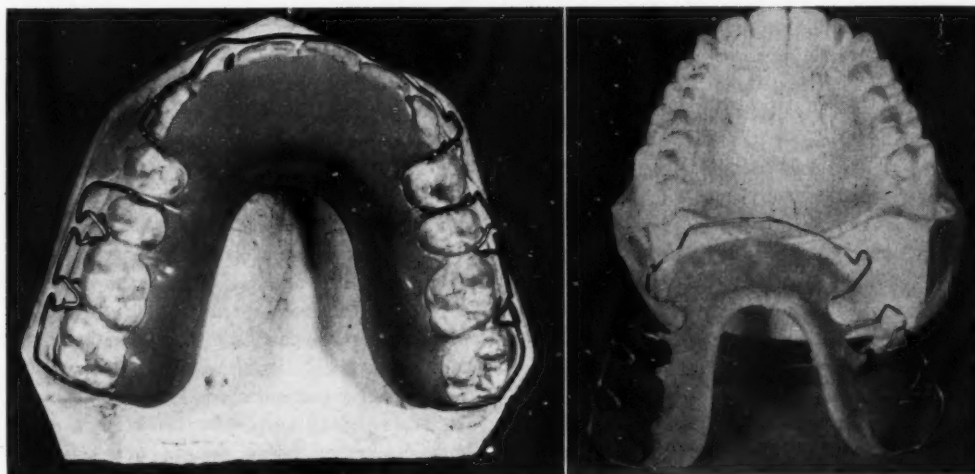
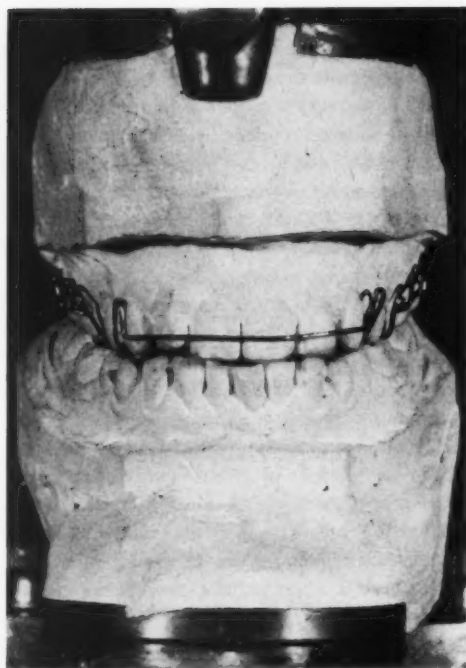


Figure 1 The bite plate is a simple appliance made of acrylic resin and may be made with or without retentive clasps



*Figure 2 Usually an anterior wire extends from cuspid to cuspid to secure the stability of the anterior teeth*

the bite plate continuously day and night, he removes it at mealtime, three times daily, after which it is replaced. The stimulation which the teeth receive during these three functioning periods prevents any deleterious tissue changes in the periodontium.

Later, when final rehabilitation is accomplished, a new bite plate is made for the patient, and is worn only at night. The length of time it is worn varies with the individual.

The bite plate is a relatively simple appliance, made of acrylic resin. It may be made with or without retentive clasps (Fig. 1). It is horseshoe-shaped, and leaves most of the palate area uncovered. Usually an anterior wire is placed, extending from cuspid to cuspid to secure the stability of the anterior teeth (Fig. 2). If clasps are used, they are of the arrow type and are placed in the bicuspid and molar interdental buccal embrasures, near the cervical region (Fig.

*Figure 3 If clasps are used, they are of the arrow type and are placed in the bicuspid and molar interdental buccal embrasures*



3). This type of retainer does not restrain the occlusal movement of the bicuspid and molars.

On the anterior palatal surfaces of the bite plate a flat bite wall is made extending from cuspid to cuspid. This flat plane meets the incisal edges of the lower six anterior teeth at an exact angle of 90 degrees, so that only a vertical force is exerted on the anterior teeth. The incisal edges of the anterior teeth usually are leveled so that uniform contact is made against the bite wall. There should be no depressions in the flat plane to prevent the free movement of the mandible into its true centric relation. The height of the bite plate should allow the patient from 1.5 to 2 mm. of freeway space.

Because of the smooth, flat incisal plane and a sufficient freeway space, the patient will be able to attain physiologic rest position, the condyles will be relieved of any strain and consequently the correct neuromuscular pattern gradually will

condition the patient to a correct centric relationship. This helps later in taking the various jaw registrations for mounting the casts.

The patient wears the bite plane for from three to six months; sometimes longer, if orthodontic treatment is included. Since an interocclusal space is created between the opposing bicuspid and molars by the anterior bite wall of the appliance, the posterior teeth gradually will egress until they contact each other.

When normal masticatory movements can be made without premature injurious contact of the anterior teeth, the proper posterior opening has been attained and the reconstruction may be initiated.

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#### **Physiologic abrasion in human dentition**

(Die physiologische Abrasion  
des menschlichen Gebisses)

J. G. de Boer. *Schweizer. Mschr. Zahnk.*  
67:113-130 Feb. 15, 1957

Physiologic abrasion in helicoid forms in the human dentition was first reported by F. Ackermann in 1941. Helicoid abrasion of occlusal surfaces can originate from different causes. Theoretically, helicoid abrasion is only possible if all occlusal surfaces of the upper and lower teeth cross each other in centric occlusion.

This condition may appear also during abnormal masticatory movements. Assuming that such masticatory movements result always in a centric occlusion, the physiologically helicoid abrasion would only occur in instances in which the crossing of occlusal surfaces in a centric direction is present. Such an abrasion, however, can be produced only if minor masticatory excursions of forward and backward motions are predominant. These movements doubtless have played an important part in the development of helicoid abrasion found in molars of elephants.

The function of the teeth in animals and humans consists in securing and preparing the food for digestion. The teeth are arranged in such a manner that they will perform the best functional service according to the individual's specific

needs. It is obvious, therefore, that the dentition has a mission to fulfill as an integral part of the mechanism of the body, and as such the teeth are subjected to the same physiologic and pathologic influences as other organs.

Abrasion is the destructive process affecting the labial and buccal surfaces of the teeth. Usually it appears near the gingival margin, but occasionally it extends to the middle of the crown.

The condition of crossing of occlusal surfaces in centric occlusion in upper and lower teeth is responsible for the particular shape of the helicoid abrasion. Large and transversal excursions of the masticatory movement, however, exert a leveling influence.

Satisfactory treatment presupposes the establishment of the causes in all instances of severe abrasion.

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#### **Inlays and fillings**

#### **Further studies on the contour of Class II restorations with various matrix technics**

Cosmo Castaldi, Ralph W. Phillips  
and Robert J. Clark. *J.D.Res.* 36:462-471  
June 1957

One type of vibratory condenser and two types of impact condensers were studied to determine the effect of mechanical condensation technics on the contour of Class II restorations when various matrix band procedures were used. Results were comparable to those obtained with hand condensation in a previous study and emphasize the necessity of wedging the band to avoid gingival overhang. Use of heavy pressure with one of the impact condensers increased the overhang.

The influence of passing dental floss through the proximal border of the newly formed restoration was investigated. The use of floss immediately after condensation does improve the contour and reduce the overhang produced by an un-



wedged band, but is not as satisfactory as use of the wedged band. Use of floss four minutes or more after condensation is of little or no value.

The mercury content in both the proximal and gingival regions was always higher than in the bulk of the restoration. The differences ranged as high as 5.0 per cent. No particular technic or condenser was superior. Although the unwedged band did not produce an increase in mercury content at the gingival margin, when the excess flash was analyzed an average increase of 7.2 per cent in mercury content over that found in the bulk of the restoration was revealed.

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### **Pulp management for the child patient**

Melvin A. Noonan. *J.Den.Children* 24:91-97  
June 1957

Histologically there is no difference between the pulpal tissue of deciduous and permanent teeth. The primary function of the dental pulp is the production of dentin. The pulp in both deciduous and permanent teeth, under favorable conditions, will produce a barrier of dentin as protection from irritation. The blood supply to the pulpal tissue is abundant, and repair of this tissue resembles the repair of any other connective tissue.

The dental pulp occupies completely the pulp chamber and root canals. The pulps of young teeth are large and have long horns extending into the cusps. As the tooth ages, the pulp is reduced in size by the deposition of dentin which makes the chamber smaller. The pulp chamber is shaped similarly to the outer surface of a tooth, but the mesial horns of molars are closer to the outer surface than are the distal horns and therefore are more easily exposed.

During cavity preparation caution is necessary to protect the dental tissues from excessive heat. When speeds of 5,000 rpm or over are used with rotary instruments, a coolant is essential and the water spray is the more efficient.

Much has been written about cavity "sterilization" but most of this is empirical. It would be ideal to sterilize the dentin over the pulp, but

this cannot be done merely by wiping a drug on a cavity floor. In shallow lesions the cavity preparation may be deep enough to leave only sound and uncontaminated dentin. In deeper cavities, and especially in those proximating the pulp, the drug used should be sealed in to be effective. Zinc oxide and eugenol have germicidal and abirritant properties. Promising results have been obtained by sealing in a paste made of penicillin and camphorated parachlorophenol.

Zinc oxide and eugenol cements are soothing to the pulp and have better sealing properties than other solutions. The use of zinc oxide and eugenol cements as liners for silicate cement and self-curing restorations will result in discoloration, so other liners must be used.

Baseplate gutta-percha and temporary stopping have poor sealing qualities and are irritating to the pulp, and should not be used as temporary restorations. The self-curing acrylic resins have poor sealing properties and although not noticeably irritating to the pulp, they require a base.

Silver amalgam transmits thermal shock and is capable of irritating pulpal tissues in deep cavities. Silver amalgam should be placed over a zinc oxide and eugenol base or over a cavity liner in shallower cavities.

If the pulpal tissue has not degenerated beyond a certain point, exposures can be handled so that the pulp will remain vital. The exact state of the pulp cannot be determined with present-day pulp testers or roentgenograms; until more accurate means are developed, there will be failures.

Small exposures may be handled by pulp capping; teeth with larger involvements need pulp-tomies. Today the material most commonly used over amputated pulps is calcium hydroxide, but some studies show that dentin bridges can form in the absence of calcium ions.

When pulpal tissue is curiously exposed, the results of the pulpotomy are better if the dentin can be sterilized and the pulp anesthetized before the amputation is done. Caustic drugs should not be used, and a blood clot should be allowed to form over the exposed surface of the remaining pulp tissue.

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## Periodontics and endodontics



### Periodontics

#### Occlusion and articulation in the etiologic complex of periodontal disease (Okklusion und Artikulation im Ätiologiekomplex parodontaler Erkrankungen)

H. R. Mühlemann, H. Herzog and  
K. H. Rateitschak. *Paradontol., Zurich* 11:20-23  
March 1957

The degree of tooth mobility is closely related to the functional condition of the periodontal structures. Normal, intermittent and evenly distributed stress creates tension zones in the periodontal membrane.

Although tooth mobility may remain unchanged temporarily, a long-lasting and abnormal stress such as is produced by hypofunction or dysfunction can lead to an unfavorable secondary increase in tooth mobility which is due to initially submicroscopic but later microscopic alterations of the fibers in tension zones. Consequently, pressure zones may arise gradually.

Such microscopic injuries, clinically detectable by tooth mobility measurements, represent occlusal trauma. Occlusal trauma, however, is not identical with "excessive stress." It can be caused by hypofunction.

In analyzing traumatic occlusion, the traumatogenic occlusal region should be distinguished from the traumatized occlusal region. These regions do not necessarily coincide topographically. Although there is, as yet, no sufficient scientific evidence available, it can be assumed that occlusal trauma may cause macroscopic lesions such as periodontal pockets to develop.

A case of severely disturbed masticatory function is reported. The patient, a 39 year old woman, showed hyperfunction on the right side and hypofunction on the left side. Comparatively balanced occlusion existed in the molar region, especially on the left side. This syndrome of left

side hypofunction, disproportionate attrition and, therefore, dysfunction in the left posterior region led to periodontal lesions and an alveolar atrophy in the region of the left molars. The asymmetry in the distribution of periodontal lesions, observable roentgenographically, was in this instance the consequence of a long-lasting asymmetric masticatory function.

The method of choice for restoration of symmetric and balanced masticatory function was selective grinding. Herzog demonstrated the favorable influence of a restored masticatory function on the condition of the periodontal tissue.

Jankelson wrote that although gnashing and grinding of teeth cannot be considered as part of mastication, under emotional stress the skeletal musculature may exhibit general and sustained hyperfunction, and the nervous response of the masticatory muscles can be evidenced by increased clamping and grinding movements.

The theory that occlusion can be regarded as a constantly changing condition because of wear offers a reasonable explanation for previous anthropologic findings, and is compatible with the histology of human teeth.

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#### Preventive periodontics

J. F. Peters. *Mil.Med.* 120:423-425 June 1957

Dentists do not give an adequate portion of their time to preventive periodontics, and they fail to provide their patients with proper education and motivation.

Periodontal disease heads the list of the causes of the loss of teeth. The dentist must spend more time educating his patients regarding oral hygiene and must motivate patients to better personal oral care by pointing out the inevitable results of poor oral hygiene and the rewards of persistent, correct hygiene. The patient must understand that failure to use a toothbrush properly and frequently results in the establishment of an environment conducive to tissue breakdown. Each patient's oral hygiene technic must be checked and rechecked to determine whether he has attained proficiency.

Dentists must be educated and motivated to diagnose and treat the early signs and symptoms

of periodontal disease. Such diagnostic signs as changes in tissue texture, color and architecture, the presence of hemorrhage or suppuration, and early roentgenographic changes must be noted. Treatment or prophylaxis must be aimed at the elimination of etiologic factors in the earliest stage.

Preventive periodontics is the moral and professional duty of every naval dental officer. Periodontics has received increasing emphasis in the Naval Dental Corps. The portion of the Naval Dental School's general postgraduate course dealing with periodontology has been continually expanded to keep pace with recent ideas and techniques. Courses in oral hygiene are maintained for naval dental technicians, and this training is supplemented by in-service training programs. Literature on the care of the teeth and the prevention of dental disease has been compiled, published and distributed to personnel. Training films on these same subjects have been produced. At naval recruit stations, lectures and films on the basic ideas of oral hygiene, including proper toothbrushing technic, are presented and toothbrushes are distributed. Naval dental officers are encouraged to supervise and administer oral hygiene programs, which are supplemented by films, lectures and literature. Much is being done to expand and improve the Naval Dental Corps' program of preventive periodontics.

Preventive periodontal therapy remains the responsibility of the individual dental officer.

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#### **The metallurgical investigation of periodontal curettes: a preliminary report**

Ralph F. Kanders and Charles E. Barrett, Jr.  
*J.D.Med.* 12:127-129 July 1957

The performance of periodontal instruments—including such factors as edge acuity, instrument efficiency and improvement of the cutting edges of curettes—is being investigated by the authors.

The basic types of tool steel utilized in curet manufacture are stainless steel and carbon steel. The optimum carbon content of tool steel is in the range of 1.20 to 1.30 per cent. If the carbon content is increased above 1.30 per cent, the

steel is too brittle; if below 1.20 per cent, it is softer. Stainless steel is considerably softer than carbon steel, partly because stainless steel has half the carbon content of carbon steel.

The best type of carbon tool steel has insufficient wear resistance for the intended performances in periodontal therapy. Among other steel alloys and combinations under investigation is tungsten carbide. Tungsten carbide is not a steel but a sintered metal formed by mixing tungsten powder with carbon at elevated temperatures. Tungsten carbide fractures more easily than steel under impact. The brittleness of tungsten carbide requires a secondary support to prevent fracture by load deflection. Stainless steel can be used to reinforce or back tungsten carbide.

The New York University type modification of the McCall curet is a trapezoid in cross section. The cutting edges are at the broader base or the facial surface. A section of steel is cut from the tip of a stainless steel curet and a square of tungsten carbide is brazed in place of the section of steel removed. The tungsten carbide part is polished flush with the remainder of the curet outline. The curet tip has about 3 mm. of tungsten carbide from the tip to the shank.

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#### **The role of nutrition in periodontal disease**

Harry Roth. *J.D.Med.* 12:119-122 July 1957

An important systemic cause of periodontal disease is poor nutrition. Nutrition is a bodily process, concerned both with what is eaten and what happens to the food after it is eaten. Poor nutrition can contribute to periodontal disease in at least three ways: (1) ingestion of a poor diet (primary malnutrition), (2) inability of the body to make use of the food (secondary or conditioned malnutrition), and (3) selection of soft foods with poor texture or consistency which do not create sufficient oral and intestinal function.

Most people do not eat a well-balanced diet. Among those who do are patients who yet have poor nutrition because of the inability of the body to make proper use of the food ingested. This may be the result of systemic ailments.

The functional exercise received by the bone



and gingivae supporting the teeth during the chewing of tough, coarse, fibrous foods, such as those contained in raw salads, fruits and properly cooked vegetables, is essential for healthy teeth and periodontium. Soft foods such as overcooked vegetables, cakes, candies and pastries do not stimulate the supporting structure of the teeth. Recent studies indicate that a firm type of food may make the tooth structure more dense and may aid the periodontium to resist disease.

Unless some bodily disease interferes with digestion, absorption or assimilation, the average dental patient can be helped by a good diet. Cakes, candies, pastries, chocolate drinks, refined white flour and sugar products should be eliminated from the diet. A tossed, raw, mixed, green salad should be eaten every day. One egg should be consumed daily, preferably boiled or poached. Whole grain bread and cereals should be included in the diet. Three glasses of milk (whole, skimmed or buttermilk) should be taken daily. The meal should be terminated with a fruit, stewed or raw. Liver or some other organ meat should be ingested at least once a week. Fruit or fruit juice can be taken three times a day if it produces no unfavorable reaction. Fish or other sea food should be eaten once a week. Besides potato, one yellow and one green cooked vegetable should be included in the main meal. Butter or fortified margarine may be used sparingly.

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#### **Periodontal disease: local therapy**

F. A. Carranza, F. A. Carranza, Jr.,  
and J. J. Carraro.

*Internat.D.J.* 7:209-237 June 1957

Periodontal disease is caused by local and systemic factors. Local irritant factors, such as tartar, materia alba, food impaction, unsatisfactory dentures and operative dentistry, produce inflammation which brings about or favors the formation of the pathological membrane. The pocket, as it becomes deeper, causes loss of bone and periodontal resorption. Dental malposition and excessive or uneven abrasion leading to occlusal disharmonies, harmful habits and unbalanced pressures on the soft tissues are traumatic

factors favoring or causing loss of bone and disorganization of the periodontal membrane and may contribute to deepening of the pocket.

The pocket and the loss of bone are the two fundamental manifestations of periodontal disease. Suppuration and hemorrhage result from pocket formation. Migration of teeth, diastema and premature mobility are the results of bone loss.

Systemic factors influencing periodontal disease include those affecting defensive reactions against irritation and inflammation, and those disturbing the normal metabolism of bone and periodontal membrane. The major aim of treatment is to arrest the loss of alveolar bone and, if possible, to encourage its regeneration. Treatment must be approached from both the local and systemic viewpoints.

The treatment of local factors consists of the total elimination of the pocket and all its causes and the removal of factors causing trauma. The elimination of the periodontal pocket may be achieved by reattachment, or through elimination of the outer wall by retraction or surgical removal. Techniques aimed at reattachment, especially indicated in intrabony pockets, are still in the experimental stage. Satisfactory results have been obtained only in isolated instances. One of the problems is to maintain sterility for the clot until it is organized. The local and systemic use of penicillin, after scaling and curettage and the elimination of the traumatizing factors, has given promising results.

Scaling and curettage eliminate the pocket by retracting its outer wall. Their effectiveness depends on (1) the extent to which the inflammation in the lateral wall of the pocket contributes to the pocket's depth, and (2) the cicatricial retraction produced by curettage.

The surgical techniques used in treating periodontal disease have been classified as techniques which do not uncover bone (simple gingivectomy) and techniques which uncover bone (deep gingivectomy and flap operations).

There is a pronounced divergence of opinion as to the action of trauma as an initial cause of the formation of the pocket. Histopathologic studies indicate the trauma at least encourages the deepening of the pocket. Occlusal trauma is treated by achieving an occlusion functionally

satisfactory for the supporting structures. To this end it is necessary to eliminate as far as possible all premature contacts and interferences, to seek a wide distribution of forces, with an incidence as far as possible axial, and to enable the jaw to glide smoothly without interference. All may be achieved by selective grinding, perhaps supplemented by orthodontic and prosthetic measures. Harmful habits, including bruxism, should be eliminated.

The systemic treatment of periodontal disease is still in its experimental phase. With the present state of knowledge, local treatment is the more effective.

An extensive bibliography is presented of the literature of Europe and North and South America.

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#### Endodontics

##### **Simplified method of pulp capping adult teeth with calcium hydroxide**

Everett D. Mumaw and Phillip Cooper.  
*U.S. Armed Forces M.J.* 8:979-984 July 1957

A simple method of pulp capping with calcium hydroxide without the use of a sterile technic, rubber dam, antibiotics or temporary fillings was found to be clinically effective. The patients were taken at random at two air force bases. The age of the patients varied from 17 to 46 years, averaging 27 years. Teeth with pulp exposed by caries or by mechanical means were treated.

Preliminary roentgenograms were taken of each tooth. Only teeth that had no apical involvement and had reached full adult apical development were used in this study. In every instance all caries was removed, using normal, clean operating procedures. When the carious portion extended to the pulp, it was completely removed no matter how far into the pulp the operation ex-

tended. If a pulp on exposure showed any visible signs of infection, enough of it was removed to leave healthy bleeding pulp.

The tooth cavity and mouth were then rinsed with tap water and the cavity was dried with air. A thick layer of calcium hydroxide powder or paste was applied directly over the exposure. The calcium hydroxide cap was lightly air dried so as not to disturb it, and sealed over with zinc phosphate base cement. Next, the cavity preparation was completed and a permanent restoration placed. The entire procedure, including a final roentgenogram, was completed in a single appointment.

Of 164 teeth whose pulps were capped in this manner, 5 (3.0 per cent) became painful and were extracted during the first two weeks; 159 of the teeth (97.0 per cent) were vital and in excellent condition after a year or more.

Twelve of the 159 teeth saved by pulp capping caused some pain within the first two weeks, and 15 others were sensitive initially to extremes of temperature, but in all instances both pain and sensitivity had completely disappeared by the end of 12 weeks.

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##### **Roentgenoscopy in dental focal infection**

(Klinische Erfahrungen mit der Röntgentestung von Zahnherden)

Fritz Driak and Hans Langer.  
*Neues Zahnkh.* 3:16-18, 1957

At the Dental Institute of the University of Vienna, pulpless teeth which were suspected as possible foci of infection were examined with the roentgenoscope, an instrument for studying structural changes by means of fluorescent screens excited by roentgen rays.

In teeth with inadequate root canal fillings, a sharply outlined region of destruction of osseous tissue, especially around the apex, was observed. Teeth in such a condition would generally be condemned by most dentists and physicians because the rarefied region could be considered as extremely infected. Such instances frequently are regarded as unavoidable failures in endodontic treatment rather than as the result

of improper procedures. When those conditions are studied with the roentgenoscope, it becomes clear that the spaces around the apexes are occupied by granulation tissue which is attached to the tooth surfaces.

Roentgenoscopic tests also establish the presence of either hyposensitivity or hypersensitivity; calcifying pulps; thickening of the lamina dura or of the walls of the trabeculae; breaks in the continuity of the trabeculae around the tooth apex; hypercementosis of the root; sclerotic regions; decalcified, abnormally striated or mottled trabeculae, and retained roots.

A relation exists between dental focal infection, subacute bacterial endocarditis and bacteremia. These conditions can be controlled with antibiotics; and if a focus of infection is determined, it should be eliminated immediately. If surgery is contemplated, postoperative subacute endocarditis and bacteremia can be prevented by antibiotic treatment.

When an obvious focus of infection is established in the oral cavity of an otherwise healthy patient, it must be removed. In similar manner, obvious foci of infection in patients suffering from chronic systemic diseases should be eliminated. Dentists should be aware, however, that dental focal infection is not an exclusive causative factor in systemic disease.

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#### **Treatment of periapical infection with Bakelite paste**

(Primeneniie bakelitovoi pasty dlia lietsheniia peritsemnitov)

M. M. Weisbrem. *Stomat., Moscow* 36:8-12 Jan.-Feb. 1957

Although numerous chemicals have been used for root canal sterilization, completely satisfactory results have not always been achieved, particularly in the narrow and impenetrable canals of multirooted teeth.

A new method of root canal filling with a plastic paste of the Bakelite type has been introduced. This method has proved to be more effective than other methods of treatment.

Equal parts of tricresol and 40 per cent Formalin solution are heated to produce a polymerized synthetic resin, one part of which diluted in two parts of 96 per cent alcohol gives a liquid of reddish brown color, which hardens rapidly on the slab to form an adhesive layer hard to remove.

The root canal filling paste was prepared by placing two or three drops of this liquid on the slab and mixing it with bismuth carbolate or sodium bicarbonate until a soft paste was obtained. Both of those compounds were alike in their action and differed only in that the former was radiopaque. It is recommended in all instances of periapical infection of microbic origin and pulpitis complicated with periodontitis, except in instances resulting from the use of arsenic.

Chronic periapical infection is treated as follows: The pulp chamber is opened, thoroughly cleansed and washed of all carious contents. Then the root canal is gradually cleansed by removing all necrotic tissue and treated with sodium hypochlorite solution until clean. The excess moisture is absorbed on dry cotton pellets, the canal washed with hydrogen peroxide and with alcohol, filled with the paste and a permanent restoration inserted with a dentin base. This operation requires one sitting. If the treatment needs to be performed in two sittings, a cotton point with sodium hypochlorite solution is left in the root canal for 24 hours after the mechanical and chemical treatment performed during the first visit. The canal is filled and the tooth restored on the second visit.

Eleven teeth with a diagnosis of chronic periapical infection classified as hopeless were treated and studied. The results were encouraging, and during the time from February to May 1955 this method of treatment was applied on 31 anterior and 87 posterior teeth. Of these 118 teeth, treatment was unsuccessful in only 7, or 5.9 per cent.

The paste does not contain harmful ingredients. It is bactericidal and does not irritate the periapical tissue even when extruded through the apical foramen. The paste can be removed easily if necessary. The results indicate that only one, or at most, two treatments are required for positive results to be achieved.

## Professional activities



## Education

### Modification of an apparatus for teaching orthodontics

H. Pogrel. *D.Practitioner* 7:341-343 July 1957

The undergraduate studying orthodontics frequently has to strain his imagination severely, because of the difficulties encountered by the lecturer in illustrating the subject matter.

A simple, vivid apparatus is described which is used by the writer in conducting courses in basic orthodontics under the auspices of the Lancashire County Council School Dental Service.

Simple prototype "bases" for the first model were created from perforated hardboard to which the model teeth were attached by drawing pins. The bases were affixed to the wall by means of rubber suction feet. The rubber head was forced through a suitable hole in the hardboard, and a steel pin applied to prevent withdrawal of the rubber head. Six such feet per base were used. When such feet were used and when the suction pads were wiped with glycerin or light oil, they could be pressed onto any flat smooth surface. They firmly hold the bases in place, yet movement of either base is easily performed to represent almost any given basal bone relationship.

Being free of one another, the bases can be positioned to represent any mandibular-Frankfurt angle. When a length of elastic is attached to represent the combined muscle forces utilized in activation of the Andresen plate, the purpose of that appliance can be described graphically.

The final model used in the courses comprises tin-plate bases 30 by 12 inches, painted black for contrast. Model teeth about 6 to 7 inches high, cut from sheet acetate (white for deciduous teeth, cream for permanent), are attached to the bases by Eclipse Button Magnets A. The magnets are attached to the teeth by wood glue, and steel clips pass through the acetate to contact the sides of the slot in the middle of the magnet. Self-curing acrylic resin locks the magnet, clip and acetate and also forms the "handle" on the external surface. Six rubber suction feet per base are required, but steel retaining pins are not now necessary as the holes in the tin plate can be drilled accurately.

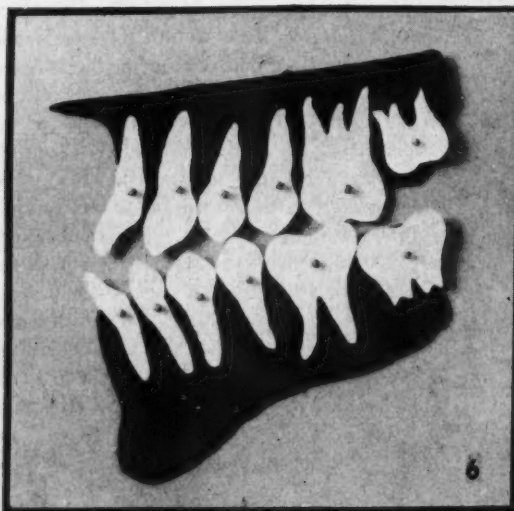
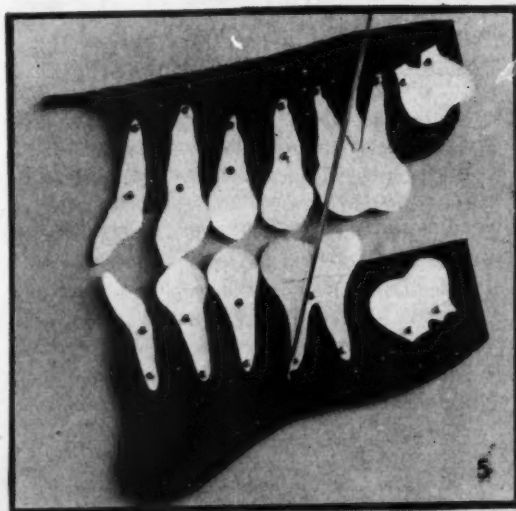
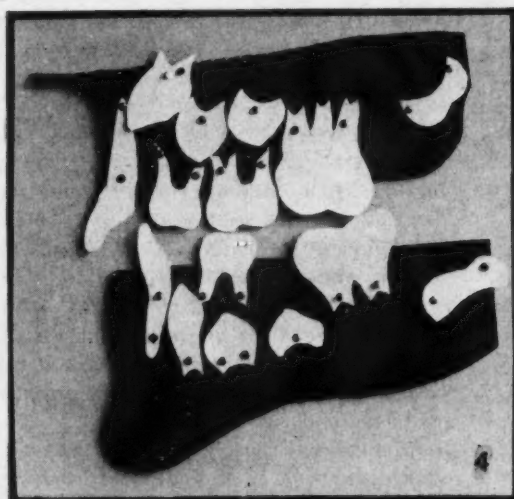
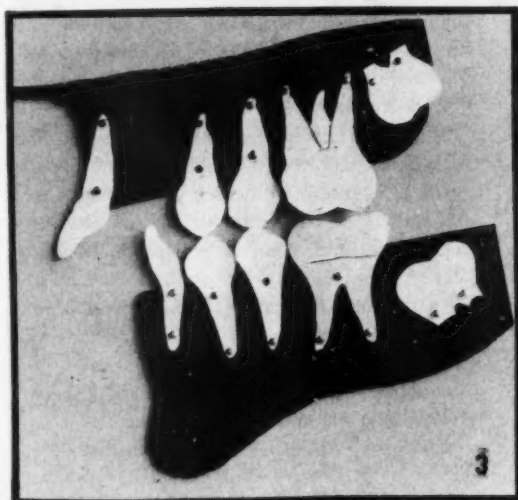
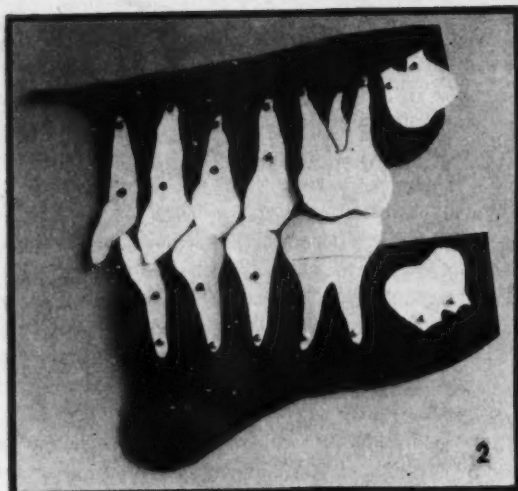
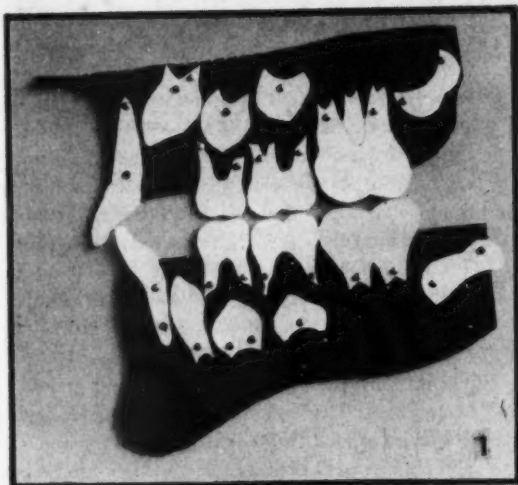
It has been found that six such feet hold on to a painted wall a base supporting models of nine deciduous and permanent teeth. The whole apparatus can be disassembled and stored quickly by releasing the suction.

The magnets are excellent for the purpose and permit easy representation of tooth movement. Within seconds the possible effect of the premature extraction of a deciduous lower second molar can be portrayed graphically.

*Lancashire County Council Health Department, Lancashire, England*

- 1 Mixed dentition, normal occlusion
- 2 Permanent dentition, normal occlusion
- 3 Permanent dentition, Angle's Class II, Division 1 malocclusion
- 4 Mixed dentition, disturbed occlusion
- 5 Positioning of bite for Andresen appliance to treat a patient with Angle's Class II, Division 1 malocclusion
- 6 Final model utilizing magnets, arranged to illustrate Class III malocclusion, anterior open bite, steep mandibular-Frankfurt angle





### Continental dental schools

H. R. Down. *Australian D.J.* 2:143-145 June 1957

The author, lecturer and senior demonstrator in the department of conservative dentistry, University of Melbourne, has observed 16 dental schools in Vienna, England and Sweden. He studied 13 months in the Eastman Dental Clinic in London and six months at the University of Manchester.

In 1953 in Vienna the dental course was regarded as a specialist course, to be taken after the completion of medical training. There is now a tendency in Germany, and perhaps also in Vienna, to separate the two fields. The dental course at the Zahnärztliche Universitätsklinik in Hamburg has been extended from two and a half to five years.

The Eastman Dental Clinic combines the functions of a hospital and teaching school. As the Institute of Dental Surgery it is affiliated with the University of London. Only postgraduate work is done. The Eastman Dental Clinic presents many short courses for the private practitioner who is unable to spend more than one or two weeks away from his practice. Subjects presented include periodontics, chrome-cobalt partial denture work, complete denture technic, and crown and bridgework.

Before he starts clinical work at Eastman, each student and house surgeon is required to take a course of about ten days in the phantom head room. This gives the staff some idea of the standard of work done by each operator, and gives the operator time to learn a little of crown and bridgework before commencing in the surgery. In the surgery he spends a half day per week on dresser work, but apart from this and an occasional amalgam or silicate restoration, spends the whole of his time in porcelain crownwork, bridgework, root treatments and apicectomies.

Although Malmö, Sweden, has a population of only 200,000, the dental school there was the largest of the 16 visited. The school is half again as big as the school in Sydney and was the most modern and best equipped of all those visited. Eighty students a year are taken for the five year course, so that there are 400 students attending.

As with other schools in Scandinavia, there is a large waiting list; students are selected for suitability. Because of the restricted intake of dental students in Scandinavia, generally, it is not uncommon to find Norwegian and Danish students at the dental schools of Newcastle and Glasgow.

The Malmö curriculum is similar to that of Melbourne. Subjects taken the first year include anatomy (both general and dental), histology (general and dental), embryology, chemistry, physics, physiology, bite physiology and general bacteriology. The students' hours are from 8 A.M. to 6 or 7 P.M., with a break of one hour for lunch. The clinical work is of a high standard. Students are taught the construction of acrylic crowns, but porcelain is regarded as the material of choice. Generally, antibiotics were not regarded with favor in any of the undergraduate schools visited. The sole use of self-curing acrylic resin was for the cementation of Class V acrylic inlays.

At Malmö a department of occlusal or bite analysis was formed, in addition to the departments of conservative dentistry, prosthetics and oral surgery. A patient requiring oral rehabilitation in some form is sent to the department of bite analysis. Impressions are taken by a student and the cast mounted on an anatomic articulator and the occlusion studied. If necessary, roentgenograms of the temporomandibular joint are taken. Treatment may include spot grinding, crown and bridgework, and partial dentures.

193 Spring Street, Melbourne, Australia

### The American D.D.S. degree

R. O. Wootton. *Australian D.J.* 2:140-142 June 1957

In the past, the D.D.S. degrees of only four American universities—Northwestern University, University of Illinois, University of Pennsylvania, and Toronto University—and the D.M.D. degree from the Harvard School of Dental Medicine have been accepted for registration by the Victorian Dental Board. Of these, Northwestern and Toronto have been the universities to which the greater number of Australian graduates have gone, particularly in recent years since Illinois and Pennsylvania required overseas graduates to

complete the last two clinical years of their dental courses to obtain the D.D.S.

Toronto still offers a one year course leading to the D.D.S. degree for approved overseas graduates admitted to the final year of the normal dental course. There is no entrance examination. Selection for admission to this advanced standing is highly competitive as only four overseas graduates are accepted each year, with preference given to members of the teaching staffs of other schools and those who have done some postgraduate study.

A similar situation existed at Northwestern until two years ago. There had been growing criticism of the foreign student program at Northwestern from other American universities, on the grounds that it was unfair that a D.D.S. should be awarded to overseas students after only one academic year, when there was no assurance that their standard was equal to that of the American graduate who had spent two to four years in predoctoral studies plus his four year dental course. The present system was then formulated, designed not only for the overseas dentist who is returning to his own country on completion of the course but for the immigrant dentist who desires to practice in the United States. The object is to assure that on graduation the overseas graduate is of a standard at least equal to that of the American graduate.

An evaluation program is held, on the results of which students are accepted and individual courses planned for them. The year the author attended Northwestern was the first year of the new program. The evaluation program included 13 two hour written examinations, three days of laboratory practical examinations, three days of clinical operative examinations plus several oral examinations. For those sitting for the first program, the greatest number of failures involved the basic sciences—anatomy, biochemistry, physiology and pharmacology. Theoretical subjects were included in the course, to a greater extent than under the previous program, and included diagnosis, cleft palate, dental materials, oral physiology and applied literature.

In conjunction with the new program at Northwestern, a less concentrated one year nongraduating course leads to a certificate of acceptance.

An Australian dental graduate who had com-

pleted his course within the last ten years and who is prepared to spend adequate time in reviewing the basic sciences should be able to be accepted for the one year course.

The new program has had the effect of reducing the number of overseas dentists going to Northwestern. Illinois and Pennsylvania each require two years' attendance and entrants are accepted on previous scholastic records. The visiting graduate is able to gain great clinical experience in crown and bridgework, metal partial dentures, precision attachments, and quadrant operative procedures incorporating hydrocolloid technics. These subjects, although part of the American undergraduate program, are postgraduate as far as Australians are concerned, and it is here that the American universities undoubtedly lead the world.

It would be regrettable if, because of changing policies at American and Canadian schools or local dental politics, attendance by Australian graduates at these universities were to cease. Australian dentistry has gained considerably in the past from this constant interchange, and Australian-American good will has been fostered by visiting graduates, as has a high regard for Australian dental standards in America.

*Main Street, Lilydale, Victoria, Australia*

#### **Florida's scholarship program for the study of dentistry**

Frank T. Scott and Floyd H. DeCamp. *J.A.D.A.* 55:245-246 Aug. 1957

The 1955 Florida legislature established ten scholarships to be awarded annually to Florida students who wish to become dentists. Each scholarship may be for as much as \$1,000 a year and for as many as four years, or a total of \$4,000. It is anticipated that the awarding of ten dental scholarships each year will encourage capable students to plan for dental college even though their financial resources may appear inadequate. A second objective is to encourage well-trained young dentists to establish their practices in those areas of the state in greatest need of dental service.

The law provides that, on being awarded a

scholarship, the student must sign an agreement that after graduation from dental college and receipt of a license to practice in Florida he will practice for five years in one of Florida's smaller communities or rural areas in need of dental services. These areas are designated by the State Board of Health. For each year that the student practices in the assigned community, one fifth of his scholarship obligation will be canceled, and after five years of practice, the entire scholarship will have been repaid.

To be eligible for these state dental scholarships, a student must have been a citizen and resident of Florida for not less than five years prior to the date of his application, have completed pre-dental training at an accredited college and been accepted for admission to an accredited dental college, and be in need of financial assistance to meet the cost of studying dentistry.

Since inception of the program in June 1955, 20 scholarships have been awarded. In 1958 the first two scholarship recipients will complete their professional training and be assigned to areas in need of a dentist.

*Florida State Board of Dental Examiners, Box 2913, Jacksonville, Fla.*



### Auxiliary groups

#### **Dental mechanics and dental prosthetists** (Mecánicos dentales y protesistas dentales) Editorial.

*Rev.A.odont.Argentina* 45:32 Jan. 1957

The Association of Dental Mechanics has made public through the daily press its resolution to change its name to that of Association of Dental Prosthetists. No reason was given to the public as an explanation for the motives or purposes of the association in making this change. The Association of Dental Mechanics has had that name for many years, although more than once the actions of the members showed that their aspirations were far beyond the field of professional legitimacy with regard to honesty to the public,

as has been pointed out by the Argentine Odontologic Association (A.O.A.).

The present change of name of the association seems to be a new attempt of its members to attain a higher professional status, which fact constitutes a violation of the principles on which rest the dental care of the population and the preparation of prostheses for the patients. The A.O.A. feels compelled to report this violation.

In 1952 the A.O.A. published a book under the title "Odontology and Dental Mechanics." The various names given in articles, books and dictionaries to the useful auxiliary groups are listed in a chapter of the book entitled "the denomination." The list includes the following terms: dental technician, dental mechanic, laboratory technician, dental workshop worker, mechanics who make dental prostheses, and some other names, but it does not include "prosthetist." For many years the name "prosthetist" has been applied to the dentist who makes prostheses. The following lines appear in the books of Brea and Saizar, respectively: "It is natural that the prosthetist, having in mind the functions of the teeth. . . ." "The prosthetists have worked hard, starting with Greene's method for taking impressions. . . ." Dunning and Davenport's *Dictionary of Dental Science and Art* defines the word "prosthetist" as a specialist in prostheses.

To name dentists prosthetists is correct and in general use. To name dental mechanics prosthetists is a gross idiomatic, technical and social error. Idiomatically the error creates a confusing synonym that casts doubt as to which one is a prosthetist (the dentist or the mechanic). From a technical point of view, dental mechanics do not make prostheses. Their work is simply and purely on dental mechanics (at least if they fulfill their duties without breaking the law). A prosthesis is really a prosthesis when its application restores functions that are impaired because of missing teeth. The fact that the dental mechanics at this time want to call themselves prosthetists has a shade of mystification. The same comments apply in the social field. To call themselves prosthetists is an error on the part of the mechanics.

The Odontologic Society of Prosthetists is a society of prosthetists, unlike the Association of Dental Mechanics which is not. Despite the new



name, the society is and continues to be the society of dental mechanics. The only change is in the different name. Dental mechanics are dissatisfied with the reality of their professional condition, and they changed the name of their society because they hoped to change also the status of their condition. They try to succeed by hiding the name under a new one which is not the one that applies to dental mechanics.



### Organization

#### **The Argentine Odontological Association has lived 60 years**

(La A.O.A. cumple 60 años de vida)

*Editorial. Rev. A. odont. Argentina*  
44:463-465 Nov. 1956

The life of the Argentine Odontological Association has not been easy. Jolts and sacrifices make up its history, which began in the home of Santiago Somerville on November 5, 1896. Thirteen dentists met on that occasion and formed The Dental Society of the River Plate. It started as a trade union, but technical and scientific problems soon became its chief interests. A dental journal published then proves the point.

A period of strife was terminated by the society's reorganization in 1912 under the name of "Círculo Odontológico Argentino," with young and ambitious men at the helm. After a schism, the society took on its present organization and name in 1926.

From that date progress has continued steadily, and today the A.O.A. has its own building, publishes a dental journal that circulates in all Spanish-speaking countries, organizes conventions, brings clinicians from abroad, has the largest Spanish dental library, and owns a postgraduate school which is the principal institution in the country for the improvement of the practicing dentist. Of its 3,000 members, about 300 are foreign. These have joined principally in order to receive the monthly dental journal.

*Junin 959, Buenos Aires, Argentina*



### Biography

#### **Norman Williams Kingsley—a man of genius**

Joseph D. Eby. *Am.J.Orthodont.* 43:538-543  
July 1957

The name and achievements of Norman W. Kingsley are destined to stand the test of time in the history of dentistry. Kingsley has been acclaimed "the father of modern orthodontics," and was one of the most versatile dentists and professional men of his period. He was an accomplished dentist, orthodontist, cleft palate therapist, dental orthopedist (in the development of fracture splint principles which still carry his name), facial prosthodontist, teacher, educator, leader, author, sculptor, artist and inventor.

Norman Kingsley was born in 1829 in northern New York State. In the fall of 1849 he entered the office of his dentist uncle, A. W. Kingsley, of Elizabeth, New Jersey, and in 1852 opened his first office in Oswego, New York. His fame reached New York City and several prominent citizens persuaded him to move his office to that city. At the 1853 World's Fair in New York City, Kingsley exhibited several porcelain carvings of partial and full sets of teeth mounted on gold, for which he was awarded a gold medal. At the 1855 World's Fair in Paris, he received several medals for similar work.

In 1859 Kingsley developed an obturator with artificial velum of soft vulcanized rubber for cleft palate closure. This was acclaimed by both the dental and medical professions. He published the first book presenting standardized methods of orthodontics. His fame spread, and in 1864 he lectured before the Odontological Society of Great Britain and the London Medical and Chirurgical Society.

As one of the founders of the New York College of Dentistry (now the New York University College of Dentistry), Kingsley served as its first dean from 1865 to 1868. In 1871 the honorary degree of Doctor of Dental Surgery was conferred on him by the Baltimore College of Dental Surgery.

For 16 years he was president of the first New

York State Board of Censors (now the Board of Dental Examiners) and was the first president of the Dental Society of the State of New York and also of the District Society of New York City.

The *Index of Dental Periodical Literature* lists over 100 articles written by Kingsley. He wrote most extensively on orthodontics and cleft palate prosthetic corrections and therapy.

His bust of Christ, modeled in 1868, is his best known piece of sculpture. Kingsley also engraved on copper and wood, painted in oils, embroidered on silk, and hammered brass and other metals.

Kingsley's book on orthodontics was published in 1880. The more than 350 illustrations were hand drawn, largely by Kingsley, and converted into wood cuts. The book discusses numerous designs of metal fixed orthodontic apparatus and many tissue-borne vulcanite appliances, the forerunners of the modern "Hawley" appliance. Numerous designs of external prostheses for the artificial replacement of noses, ears, eyes and sections of the face are described.

Kingsley died in Paterson, New Jersey, in his eighty-fourth year, in 1913.

121 East Sixtieth Street, New York, N. Y.



## History

### The history of clasps

(Origine des crochets)

G. Soyer. *Rev. franç. odontostomat.* 3:869-882 Aug.-Sept. 1956.

Egypt was the cradle of dentistry. The "pastophori," physicians of the teeth, practiced dentistry as a hereditary profession. Knowledge and skill were handed down from father to son.

The replacement of lost teeth was known to many ancient people. The earliest prosthetic work probably was performed by Etruscan dentists. At that time, the replaced teeth were retained in position by gold threads and bands.

At the end of the sixteenth century, clasps made of different metals were introduced in

Europe. Paré (1540) was the first dentist to use ligature clasps. He was followed by Fauchard (1698), Laforgue (1802), Maggiolo (1807), Delabarre (1820), Lefoulon (1841), and Harris, Austen and Andrieu (1874).

In 1899 W. G. A. Bonwill wrote his revolutionary paper *A New Method of Clasped Plates Versus Movable and Unmovable Bridge Work* in which he published his "Ten Commandments" for clasp construction.

1. Normal articulation must be preserved and maintained. Artificial dentures are often inserted without any method, planning or design. The greatest possible strength of the new denture and its artistic and esthetic appearance are the fundamentals for success.

2. Careful planning of the design of clasps is essential. Clasps have been used which were either too high or too deep, and not wide enough to be retained at the abutment teeth.

3. The clasps must be constructed so as to be able to keep their positions. Dentures often move up and down because the clasps are not properly fixed and the abutment teeth cannot withstand the increased wear and tear.

4. The clasps should be fitted and soldered to the denture on the plaster cast.

5. The clasps should be soldered to the denture on the anterior or the distal surface of the teeth. This is the point where elasticity of the clasp is most urgently needed.

6. The clasps should be constructed in a manner which avoids drawing the denture away from the abutment teeth. Many dentures are constructed which force the abutment teeth out of position, thereby causing discomfort to the patient.

7. The clasps must form a unit with the denture. The value of the clasps is lost if their exact relation to the denture is not preserved.

8. Even if denture and clasps seemingly fit well, they still can fail if the proper articulation with the opposing teeth is not maintained. Faulty clasp construction causes excessive strain on the clasped teeth. The denture must rest comfortably on gingiva and palate. The clasps should embrace the clasped teeth firmly but not restrictively.

9. The clasps must be constructed to fit perfectly the prepared abutment teeth. Clasps made

to fit too closely to all parts of the tooth surface may cause caries.

10. The ideal abutment tooth must be healthy, both individually and in relation to its environment; it must be capable of withstanding the stress to which it will be subjected by denture and clasp. Its retention power must be sufficient to resist displacing forces. Any violation of this principle will result not only in an increase in wear and tear but in promoting caries.

W. G. A. Bonwill concluded his paper with the following words which still have value in present-day dental practice: "I am thankful that from the very start of my career, I have held the human tooth sacred . . . My conscience is clear because I have not extracted teeth unnecessarily. Whatever there be new in my technic, I render it to the profession as not only worthy of serious consideration, but free from any incumbrance."

27, Rue de l'École-de-Médecine, Paris 6, France

#### **Medicine and dentistry in Newcastle upon Tyne in the eighteenth century [2]**

John Boyes. *Proc. Roy. Soc. Med.* 50:229-235 April 1957

A number of traveling dentists visited Newcastle. The July 29, 1786 issue of the *Newcastle Courant* carried the following notice: "Frederick Horn, surgeon, acquaints the ladies and gentlemen of Newcastle and its neighborhood that he has just returned from London where he has been completely instructed by an eminent practitioner in the business of a DENTIST. He scales and cleans and performs all the operations of the teeth, makes and fixes artificial and removes or prevents the irregularities which take place in the teeth of young people at the time of getting their second set."

In 1761 another traveling dentist, Mr. Nathaniel Lee, claimed he was present in Newcastle by the King's authority. In 1773 "the famous Mrs. Bernard from Berlin and Brandenburg" advertised that she possessed "an infallible secret for cleansing the teeth and rendering them as white as alabaster notwithstanding they may be as black as coal remarkable done without use of an instrument."

Mr. Marks, Jacob Hemet and Hemet Hart from Mannheim also stayed in Newcastle for a short while at different periods. Jacob Hemet may have been related to George II's dentists, Peter Hemet senior and Peter Hemet junior.

In 1783 Mr. Crawcour, surgeon dentist, stayed for a short period and practiced in Newgate Street. This man may have been a relative of the Crawcour brothers who, early in the nineteenth century, emigrated to America and started the row known as the "amalgam war."

Messieur Le Sec, a pupil of Messieur Burdet, dentist to the Queen of France, paid the first of a series of visits to Newcastle in 1790. Burdet was a famous dentist, and it is possible that Le Sec was a refugee from the Revolution.

University of Durham, Durham, England

#### **Industrial health plans**

#### **Public health and dental programs in industry**

Paul H. Stewart and Jack E. McLenaghan. *J. California D.A. & Nevada D.Soc.* 33:12-21 Jan.-Feb. 1957

Industrial dentistry is that part of dentistry which is concerned with the dental health of the industrial worker as it affects or is affected by his general health or his working environment.

The Great Western Railway of England instituted the first industrial dental health program, in 1887; the plan is still in operation. The first dental program in the United States was started in 1890 by the Barber Match Co. A soap manufacturer in Brazil established an industrial dental service in 1900. One of the earliest dental programs still in operation is that established by the Metropolitan Life Insurance Co. of New York in 1915. By 1920 about 400 industrial concerns in the United States had dental programs. After 1925 many such dental programs were discontinued.

During World War II there was a revival of interest in industrial dentistry. A study made in 1941 revealed that only one company in ten with

more than 500 employees, or having an approved medical service, maintained a dental service. Forty-two per cent of these programs were in Eastern states, 37 per cent in the Midwest and 21 per cent in Southern and Western states and Canada. In 1943 the American Association of Industrial Dentists was formed. In 1952 a survey revealed that 7.5 per cent of the industrial plants in the United States maintained an employee dental service. The main reason listed for establishing these services was improvement in attendance; efficiency and good will were secondary reasons.

Most industries limit the compulsory phase of their dental services to examination and prophylaxis. Employees may choose other treatment on an optional basis. There was no general understanding of the value and scope of dental programs in industry. Only four programs conformed fully with the standards recommended by the Council on Dental Health of the American Dental Association.

The most important problem in dental health among industrial workers is not occupational hazards, but the need for regular dental examination and treatment. This will reduce absenteeism and thus improve industrial efficiency. This can be accomplished only through the cooperation of industry, state industrial dental and hygiene units, and state and local dental societies. Industrial dental health service should provide remedial, prophylactic and protective dental care, without invading the field of restorative dentistry or assuming the responsibility of dental rehabilitation. Such programs should call the attention of the industrial worker to the benefits of improved dental health. He in turn should carry this interest to his family and the community in general.

344 Fourteenth Street, San Francisco, Calif.

#### **A dentist's experience in administering a prepayment plan**

Bissell B. Palmer. *Am.J.Pub.Health* 47:468-472 April 1957

The problems of formulating, organizing and administering a nonprofit prepayment dental plan fall into four main categories: (1) statutory problems, (2) problems related to dentists and their organizations, (3) problems related to the public,

and (4) problems related to the dental insurance carrier.

If the state insurance law does not provide for dental prepayment plans, wheels must be set in motion to secure such legislation. The first step is to secure the backing and support of the state dental society.

The principal problem in relation to the dental profession has been the objection of many highly placed dentists to any prepayment plans whatever. Dentists must be educated and conditioned to the need for, and the advantages of, prepayment plans.

There is still a widespread lack of public understanding of the importance of dental care in relation to general health, comfort and good looks. Educational efforts must be intensified.

An equitable relation must be maintained between the premiums charged and the benefits given. Dentistry under prepayment dental plans is not cheap. A favorable factor is the trend for management to pay all, or part, of the prepayment health plan premiums for its employees. This is "new dental money" that increases the dental purchasing power of the community. The problems of the insurance carrier are endless; the field is new; there is no background of experience; until the past few years research in the field has been almost nonexistent.

The avowed attitude of the administration in Washington is to encourage the spread of voluntary, nonprofit prepayment health plans. These plans require initial capitalization by grants from philanthropic foundations or from individuals. They can start in no other way, and yet the Treasury Department opposes the adoption of bipartisan legislation which would permit donations to such nonprofit prepayment health plans to be tax deductible.

A second problem is "sales." A prepayment dental plan must compete for the "fringe benefit" dollar with hospital and medicosurgical plans that have been in existence for over a decade and have the means to advertise.

Happily, there are bright facets, including the basic enthusiasm of many management and union groups for the dental plan, the enthusiasm of the public press, and the gratitude of those covered by the plan.

120 Wall Street, New York, N.Y.

## Orthodontics and pedodontics



## Orthodontics

**Diagnosis in orthodontics**

(Tour d'horizon sur le diagnostic en orthodontie)

Roger Villain. *Rev.odontostomat.* 2:153-172  
Feb. 1956

Diagnosis in orthodontics should be divided into three stages: (1) determining whether the patient's dental condition is normal or abnormal; (2) differentiating between the pathologic symptoms present, and (3) evaluating the symptomatic complex.

To term the patient's condition "normal" or "abnormal" in a brief examination is difficult. In dental literature, too much stress is laid on the definition of the term "normal." In theory, normality does not exist, but in practice, it seems to be necessary to stipulate what is normal, and this term is used constantly (Graber). American orthodontists prefer the term "average" to that of "normal," but the principle on which "average" is based does not differ from that of "normal."

The evaluation of anatomic ideas, etiologic manifestations, and the simple measurement of angles in profile roentgenograms will determine whether the patient's condition is abnormal. The reference to the normal type is probably interesting for clinical report but is neither important nor informative for orthodontic diagnosis.

Abnormalities must be observed, described and evaluated (that is, differentiated from similar or related malformations) as an entity and not in a purposeless comparison with the non-existent or ideal standard "normal." Symptomatically, the inequality in volume, the presence of muscular, articular, organic and endocrinic ir-

regularities, and malrelations between various parts of the oral cavity are important.

Orthodontic diagnosis should be based on the general symptoms, and the etiologic factors are of secondary importance.

Even if an abnormal pathologic condition has been established, that in itself is not an orthodontic diagnosis. Although the great range of



Figure 1 Clinical type 1, Angle's Class II, Division 1



Figure 2 Clinical type 2, Angle's Class II, Division 2



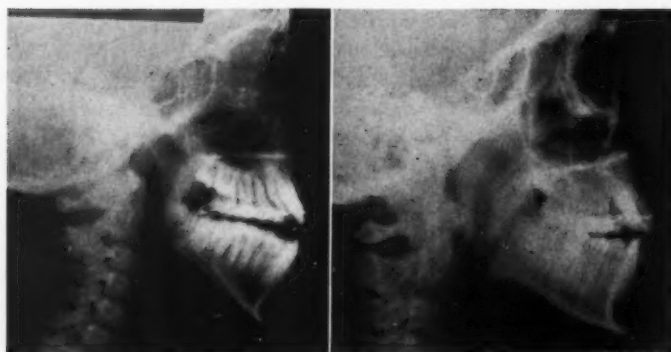


Figure 3 Left: Clinical type 1A, severe open bite. Right: Clinical type 2A, vertical hypertrophy of the horizontal ramus

Figure 4 Clinical type 3A, Angle's Class III



possible variations almost dispels any hope of applying a general rule to pathologic conditions, clinical orthodontic experience will permit an evaluation of systemic defects and their relation to malocclusions as the main factors in orthodontic diagnosis, which should include pathogenesis and prognosis.

Most textbooks on orthodontics list descriptions of pathologic conditions which are based mainly on roentgenograms that have been made with angular technics. For orthodontic diagnosis, however, the manner of collecting and evaluating symptomatic data is more important than the functional evidence of each pathologic symptom.

Orthodontic diagnosis should be based on observation of the symptoms present, differentiation between the types of malocclusions and malformations, and determination of the etiology and nature of each instance. This diagnostic syndrome can be called a "clinical type," and a different number can be given to each clinical type found.

At present, six different clinical types have been established. It is possible that many new clinical types will be discovered and that old clinical types will disappear or that terms now used will be replaced by more exact expressions.

17, Boulevard Dubouchage, Nice, France

**The role of teleroentgenography  
in orthodontic diagnosis and treatment**

(Die Bedeutung der Fernröntgenaufnahme für  
die kieferorthopädische Diagnose und  
Behandlung)

Clifford F. Ballard. *Acta CMF* 1:23-24, 1957

The use of roentgenographic cephalometry, or dental teleroentgenography, has given the orthodontist a more exact conception of the normal maxillofacial skeletal pattern and of the variations associated with irregularities of the teeth and malocclusions.

At the Institute of Dental Surgery of the George Eastman Dental Hospital in London, teleroentgenography is the method of choice for obtaining data to be used in orthodontic diagnosis, prognosis and treatment planning.

Many famous orthodontists, among them Angle, have suggested that the maxillofacial skeletal pattern cannot be changed. Angle recommended that in Class II malocclusion the upper teeth be moved distally in some instances because, otherwise, there would be excessive tipping of the lower teeth. This infers that the relation existing between the dental base and the teeth is not to be changed during treatment and that the desired changes are to be attempted in the dentoalveolar structure.

The maxillofacial pattern is genetically determined. The relations existing between the upper and lower jaw do not depend only on the maxillofacial pattern but also on the behavior pattern of the soft tissues which mold the dentoalveolar structures developing from the basal bone.

Dental teleroentgenography permits evaluation of variations in relations between the upper and lower incisors by determination of their axial inclination. The establishment of these variations is important for classification of malocclusions and, therefore, for orthodontic diagnosis, prognosis and treatment.

In all orthodontically treated instances of malocclusion, the main changes observed in teleroentgenograms were within the dentoalveolar structures, and from the viewpoint of improvement of the relations between the upper and lower anterior teeth, these changes were due to alterations in the axial inclination of incisors and

not due to changes in the maxillofacial skeletal pattern or its relationship to the dental base.

It is difficult to visualize that functional orthodontic methods can obtain changes in the inherent maxillofacial skeletal pattern, because many instances have been observed in which abnormal function did not produce permanent changes. Functional force never causes the lower jaw to grow forward at a greater rate than the upper jaw and, thereby, to improve the abnormal condition.

*Gray's Inn Road, London W.C.1, England*

**The observation, aetiology, growth problems  
and early treatment  
of developing mandibular protrusion  
(Angle Class III  
and pseudo Class III malocclusion)**

Caesar H. Venter. *J.D.A. South Africa* 12:162-168  
May 1957

Heredity, the predominance of the morphogenetic pattern, looms larger as the probable basis for most Class III malocclusions. A mesially positioned mandible frequently is found in so-called "pseudo" Class III patients, where the mandibular incisors occlude labially to the maxillary incisors and where their elongation makes it virtually impossible to obtain normal occlusion without orthodontic repositioning.

The growth pattern manifests itself in three stages: genotypical, fetal environmental and post-natal environmental. The genotype determines whether a total malformation will be present. Environmental conditions determine the severity with which malformations of genetic origin will manifest themselves.

The protruding mandible with its resulting pugnacious appearance often results in attributing to the owner traits of character foreign to him. With such a handicap a growing child cannot easily develop the poise and self-confidence so essential to success and happiness in later life.

The optimum time for orthodontic treatment is just after the eruption of the mandibular permanent incisors. At this stage little mechanical aid is needed to restore the correct mesiodistal relation of the arches. The fundamental aims of

treatment follow: movement of the mandible distally in both joints; labial movement of the upper anterior teeth, and the elimination of any cross-bite. Overcorrection should always be established to allow for the inevitable slip back that is found to occur in all such patients. The prognosis is good provided a reasonable overbite can be created.

Two cases are cited in which orthodontic treatment was started at age 80 months and 86 months, respectively; intermaxillary traction was applied successfully in both patients.

*Rand, Transvaal, South Africa*



#### Pedodontics

##### **Time of eruption of permanent teeth in British children at independent, rural, and urban schools**

E. M. B. Clements, E. Davies-Thomas and Kathleen G. Pickett.

*Brit.M.J.* No. 5034:1511-1513 June 29, 1957

An account is given of the times at which the permanent teeth of children attending different types of schools erupt. Children from independent schools form a sample whose economic background is particularly good. Those from rural elementary schools are of mixed economic background; comparison of these children with children at urban elementary schools gives an indication of the effect of rural as opposed to urban life on the age of eruption.

The permanent teeth of children at independent and rural elementary schools tend to erupt earlier than do those of children at urban elementary schools. There are no significant differences, however, between the mean eruption time of the permanent teeth within the three school groups.

Although the general tendency is toward earlier eruption of the permanent teeth in children at independent and rural elementary schools,

an apparent reversal of this tendency occurs in the mean eruption time of the second molar. It has been suggested by Leslie (1951) that the time at which the deciduous teeth are shed affects the time of eruption of subsequent corresponding permanent teeth. This suggests that the second deciduous molars, which are particularly subject to caries, have been kept longer by children at independent and rural elementary schools.

*University of Birmingham, Birmingham, England*

##### **Pedodontics—the field for interceptive and preventive orthodontics**

Kenneth E. Wessels. *J.Den.Children* 24:76-83 June 1957

Pedodontics and orthodontics are closely allied because both deal primarily with children and youth, and because of the close interrelation of many of the problems treated. If preventive orthodontics is to be a significant factor in the care of patients, it must originate with the child patient. Pedodontists constantly must think in terms of preventive orthodontics, as preventive or interceptive measures must be utilized at an early age for maximum effectiveness.

Pedodontics, by virtue of the limitation of its scope to children, is in a position to practice preventive orthodontics as is no other branch of dentistry, including orthodontics. Usually the pedodontist deals initially with the child at a far younger age than does the orthodontist. With the limited number of orthodontists, limitations must be placed on their time; their specialized skills should be utilized in treating the more complex malocclusion problems. Preventive orthodontics primarily must be the responsibility of nonorthodontists.

The pedodontist's responsibility in preventive orthodontics is as follows: (1) maintenance of a healthy deciduous and early permanent dentition by the prevention and treatment of dental caries; (2) detection, observation and correction of oral habits; (3) observation and guidance of the interchange of dentitions relative to time and sequence; (4) provision for adequate space for eruption of the permanent teeth, through preven-



tion of loss of space after the premature loss of deciduous teeth, and the restoration of space previously lost through tooth migration; (5) interception of ectopic eruption; (6) management of problems of aberration in the number of teeth; (7) management of dental malformations; (8) dietary counsel for the child; (9) evaluation of the child's general health and (10) recognition of potential orthodontic problems not included in these categories.

If preventive orthodontics is to be a reality, the child must be examined initially at a very early age, and then seen recurrently during childhood.

With the eventual reduction of the incidence of childhood dental caries to a manageable level, pedodontists will be able to assume increasingly more of the load of preventive orthodontics. It is the obligation of dental schools to prepare the student to assume this responsibility. Close liaison must be maintained between the orthodontic and pedodontic departments of the colleges, and pedodontic education at the graduate level should be closely allied with orthodontic training. Basic courses such as facial growth, growth of the child and orthodontic diagnostic procedures should be common to both areas of specialty education.

475 Grand Avenue, Iowa City, Iowa



### Growth and development

#### Surgical aspects of cleft palate

James T. Metzger. *Surg. Gyn. & Obst.*  
105:141-144 Aug. 1957

Sanvanero-Roselli and others have found that it is the arterial system which bears the responsibility for congenital lip and palate defects. In the early weeks of embryonic development, the elements on which the ultimate formation of the face depend are fed by the internal carotid artery through a single major branch, the stapodial artery. Toward the end of the second month this single root is absorbed, but a supply to its ter-

minal branches is normally ensured by rich anastomoses from the external carotid artery which eventually becomes the primary artery of the external part of the face. A major change of source of blood—that is, a complete transfer from the internal to the external carotid system—occurring at a critical time when facial elements are at their height of development could well be a point of departure in determining the lack of fusion which results in any particular example of cleft.

Examination of deformed human embryos has reflected the results of this relative avascularity. These observations support the contention that the deformity of cleft lip and palate is a craniofacial anomaly and that various degrees of mesodermal deficiency may reflect in growth aberrations beyond that presented by the cleft itself. This theory is further supported by the frequent appearance of cleft palate in many instances of craniofacial anomalies.

The aims of the surgeon are clear: (1) to consider the deformity of cleft palate as a total deformity having a vast psychologic potential and in which the associated cleft lip plays a relatively minor role; (2) to refuse any operative procedure which can add to the disability by the formation of excessive and crippling scar tissue; (3) to reconstruct the palatal defect in such a manner that its effective physiology is restored and (4) to realize that the production of normal speech is the principal objective.

Use of the Wardill-Veau-Kilner operation is suggested. In the normal child, intelligible speech begins at about 18 to 24 months; strong imitative efforts are made much earlier. It is reasonable to assume that normal speech will result far more surely if a normal palate is produced before poor speech habits are firmly formed.

If, as seems tenable, the deformity of the palate is not confined to the palate itself but constitutes a craniofacial syndrome, then it becomes clear why in the untreated patient collapse of the lateral part of the dental arches is often evident clinically by the second year and occasionally sooner. If closure of the palate and alveolus is accomplished before this collapse begins, a more normal dental arch certainly will result.

Delaware Hospital, Wilmington, Del.

## Armamentarium



## Instruments

### A new type of orthodontic pliers

(Über eine neue Zange)

Willi Schäfer. *Deut.Zahnärztebl.* 10:334-337

May 8, 1956

Numerous types of orthodontic pliers or customary pliers which can be used for orthodontic purposes are offered by instrument manufacturers.

These pliers are used, or can be used, in a more or less complicated manner, to form and bend springs, slings and clasps. Nearly all of those pliers, however, make manipulation more difficult and time-consuming than necessary.

Dissatisfied with the pliers available, many authors have recommended the use of a different type of tool, the arrowlike bending pliers. Emphasis, however, has not been on the problem of manipulation in orthodontic practice but on the utilization of a particular tool to eliminate some but not all disadvantages. Although with arrowlike bending pliers, the orthodontist can shape springs, slings, wires and clasps to the desired form, this instrument is quite expensive and difficult to manipulate.

In addition to the fact that many orthodontists and nearly all general practitioners are reluctant to invest in a relatively expensive piece of equipment, the arrowlike bending pliers have fundamental limitations that skill and experience can scarcely overcome.

A new type of pointed orthodontic pliers, designed by the author and available in Germany, can be used to accomplish the same orthodontic procedures with results that are at least equally effective. This type of pliers is comparatively inexpensive.

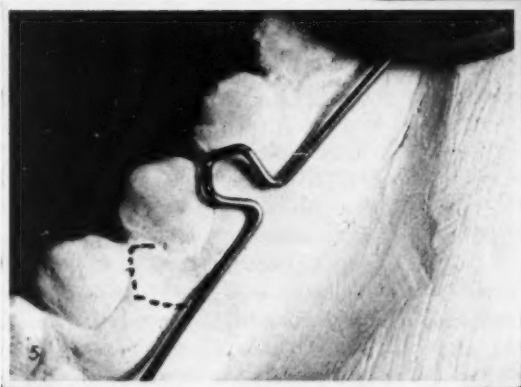
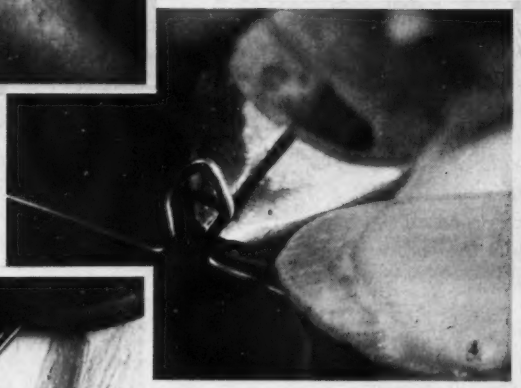
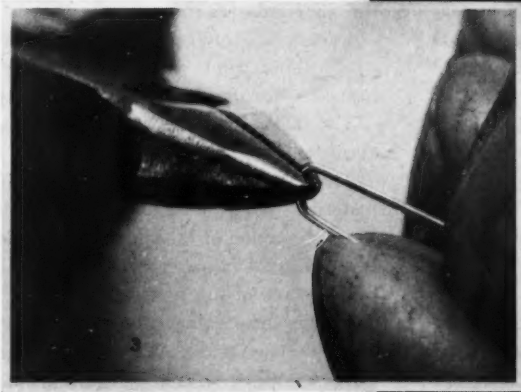
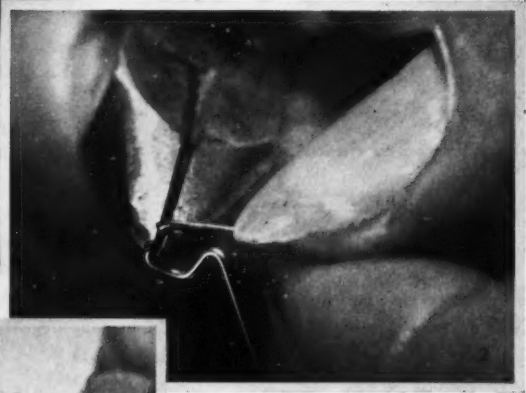
The accompanying illustrations show the easy manipulation of the instrument during different stages of procedure.

Used with a little ingenuity, the pointed orthodontic pliers will facilitate the bending of orthodontic springs, slings, wires and clasps in many otherwise difficult instances.

The results obtained with this type of pliers are superior to those achieved with far more expensive types.

*Bleichstrasse 34, Wiesbaden, Germany*

- 1 The wires are held in the grooves of the pointed orthodontic pliers, and can be bent by finger pressure
- 2 The pointed orthodontic pliers form the first sharp curvature
- 3 The formation of the first two curvatures
- 4 The formation of a third curvature
- 5 Indication of the point of insertion of the pliers (dotted line) in forming the first and the second curvature





## Materials

### Identification of dental x-ray films (Kennzeichnung von Röntgenfilmen)

M. Herter. *Zahnärztl. Praxis* 7:10-11  
Dec. 1, 1956

Only the proper marking of each dental x-ray film before development permits reliable identification, especially when several films are exposed simultaneously. The customary films are packaged ready for use, and, therefore, only the application of roentgen-contrasting marks before exposure allows appropriate identification of each developed film.

Lettering with a paste containing barium sulfate has proved to be inadequate because the obtained roentgen shadows cannot be perceived clearly.

If pieces from obsolete rubber materials which were previously used for protection against irradiation injury are cut into geometric figures such as squares (S), triangles (T), circles (C), semicircles (SC), and if these marks or combinations of them are applied to x-ray films, proper identification will be easy. With these rubber marks an excellent roentgen shadow is obtained, and these signs are clearly distinguishable even if they cover tooth structures.

Ten different identification marks can be made, which number will be sufficient for the average dental practice. The formula consists of the following signs or combinations:

1	2	3	4	5	6	7	8	9	10
S	T	C	SC	S	S	S	T	T	C
				+	+	+	+	+	+
				T	C	SC	C	SC	SC

There are no limits in the construction of other signs such as moons, stars, pentagons, hexagons, and so forth. The rubber platelets, after careful cleaning, can be used again.

*Letmathe/Iserlohn, Germany*

### Some properties of rubber base materials: a comparative investigation of Thiokol and silicon impression materials

Stig G:son Östlund. *Odont. Tskr.* 65:94-104  
April 1957

An investigation was undertaken to compare four Thiokol and four silicon impression materials as to dimensional stability, adhesiveness and elasticity.

The Thiokol materials appeared to have a better dimensional stability than the silicon materials.

On an average the adhesiveness of the Thiokol material to metal surfaces was five times that of the silicon materials.

Roughening of the metal surface or painting with rubber solution did not increase the adhesiveness of the rubber base material.

The silicon materials appeared somewhat more elastic than the Thiokol materials.

There is so little contraction with the Thiokol materials that it is of no practical importance. The contraction of the silicon preparations, however, after 24 hours is of a degree that can imperil the use of silicon as an impression material. Although the silicon materials are more elastic, this difference is not sufficient to outweigh their inferiority from a dimensional and adhesive viewpoint.

*Royal Dental School, Malmö, Sweden*

### Impermeability of customary root canal filling materials: report on a new material

(Mitteilungen über die Abschlussdichtigkeit von Wurzelkanalfüllmaterialien: Erster Hinweis auf ein neuartiges Würzelfüllmittel)

A. Schroeder. *Neues Zahnk.* 3:220-222, 1957

At the Dental Clinic of the University of Basel, Switzerland, the impermeability of the following root canal filling materials was investigated: (1) phosphate cement with and without gutta-percha pegs; (2) various brands of acrylic resins; (3) zinc oxide with oil of cloves and (4) copper amalgam. Later the following brands of root canal filling materials were tested: (1) "Diaket," (2) "Curyl," (3) "Resiston," and "AH 26," a trial compound.

With the exception of the trial compound AH

26, which is produced in Switzerland, these root canal filling materials were found to be inadequate in several of their properties. They are easily soluble in oral fluids and do not adhere sufficiently to enamel and dentin *in vitro* and *in vivo*. They frequently cause irritation of the pulp.

The experiments have demonstrated that AH 26 penetrates into the lateral canaliculi and dentinal tubules, and is comparatively impermeable. The same result was not obtainable with any other root canal filling material investigated.

Histopathologic examination of the pulp after root canal fillings with AH 26 showed repair of injury to the pulp by differentiated odontoblasts covering the pulp with newly formed dentin.

Rappoltshof 16, Basel, Switzerland



## Equipment

### A new miracle in office lighting

Arthur Lack. *Science Digest* 42:44-47 Aug. 1957

Electronic scientists are experimenting with a process that soon will bring a new type of lighting to modern offices, and dental and medical operating rooms.

This process is called "electroluminescence." The ceilings and walls are covered with flat-glass panels no thicker than customary window glass. Turning a dial obtains a soft, shadowless light of any color or intensity desired.

Electroluminescence is the fourth basic type of lighting—incandescent light, neon light and fluorescent light are already used effectively.

Electroluminescence employs the phenomenon of phosphorescence, emission of light when excited with an alternating electric field. Research advances during the last few years have brightened the hope of scientists for converting this 20 year old discovery into a new form of lighting which will be used in offices as incandescent or fluorescent light is now.

The bright future promised for electroluminescence already has excited the imagination of

several researchers. Its opportunities are endless, demanding only the creative ideas of designers and progress in manufacturing processes.

200 East Ontario Street, Chicago, Ill.



## Miscellaneous

### Possible means of inadvertent transmission of infection to dental patients

Jack H. Neff and S. Leonard Rosenthal.

*Internat. A.D. Res. Preprinted Abs.* 63

March 21, 1957

It is customary in most dental offices for the operator to adjust the spotlight and to mark the dental chart during treatment. Rarely are the hands washed after such procedures and prior to being returned to the mouth of the patient. Nor are the pen and the handle on the spotlight commonly sterilized between appointments with patients.

This study was undertaken to determine whether pathogenic microorganisms could survive on pens or light handles long enough to be potentially dangerous. Plastic pens and the metallic handles of spotlights were examined by stained smears and by aerobic and anaerobic cultures at varied intervals after use. All were positive. Examination of smears showed cocci, rods, thread forms and spirochetes in that order of frequency. Cultures yielded hemolytic *Micrococcus pyogenes* var. *albus*, nonhemolytic *Micrococcus pyogenes* var. *albus*, *Streptococcus viridans*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Micrococcus pyogenes* var. *aureus*, in that order of frequency.

A vigorous rubbing for 15 seconds with gauze saturated with benzalkonium chloride solution will sterilize the bracket table, spotlight handles and pen. The solution will not attack the plastic of the pen.

Temple University School of Dentistry, Philadelphia, Pa.



# Basic science



## Miscellaneous

### A new method for the *in vitro* production of artificial calculus

S. Wah Leung. *J.Periodont.* 28:217-221  
July 1957

A rapid, reliable and reproducible method for producing calculus under *in vitro* conditions simulating those in the human mouth is often desirable for the study of the mechanism of calculus formation and for the evaluation of the effectiveness of possible calculus inhibiting agents which may be potentially harmful or unpleasant for use *in vivo*.

A method has been devised for developing calculuslike deposits on extracted teeth. The method is simple to use, is suitable for studies of the mechanism of calculus formation as well as for evaluating on a large scale potential calculus inhibiting agents under carefully defined and controlled conditions. The results are reproducible from one experiment to another, and the deposits formed by this method closely resemble naturally occurring calculus on the basis of chemical and roentgen-ray diffraction analyses.

The apparatus consists essentially of a movable tray (Fig. 1) on which are placed the Pyrex cylindrical crystallizing dishes containing the saliva, with the teeth suspended above the containers. The level of the saliva in relation to the crowns of the teeth is altered merely by tilting the tray to a set angle. To tilt the tray from 45 degrees to horizontal, a wire cable is hooked to the front border of the tray, looped through a pulley suspended overhead, and attached to the rotating arm of a motor mounted below the

bench on which the tray rests. The motor is geared to provide 1 rpm. The motor, through the cable and pulley, lifts and lowers the front part of the tray, thereby effecting a change in the tilt of the tray from the resting 45 degree position to the horizontal, and back, during each rotation.

The saliva containers are placed in five rows of ten each on the tray. In each container 20 ml. of saliva is used. With each cycle the crowns of the suspended teeth will be immersed for about half a minute, exposed to air for about 15 seconds, and in the process of being either immersed or exposed for the remaining 15 seconds.

A polyethylene-covered wire hook is inserted through a small hole drilled in a mesiodistal direction through the root of each tooth close to the apex. The other end of the hook is looped over a glass rod which is fixed at both ends to the sides of the tray by means of spring clips. These glass rods are positioned so that they lie parallel to the rows of dishes, one to each row, and slightly toward the anterior half of the containers. The teeth are suspended so that the crowns are directly over the saliva containers, and the distance between each tooth and the container is adjusted so that, when the tray is tilted, the crown will be submerged completely in the saliva (Fig. 2). Two teeth can be suspended conveniently in each container. With 50 containers 100 teeth may be used at the same time. By testing a different agent with each group of five to ten containers, several agents may be

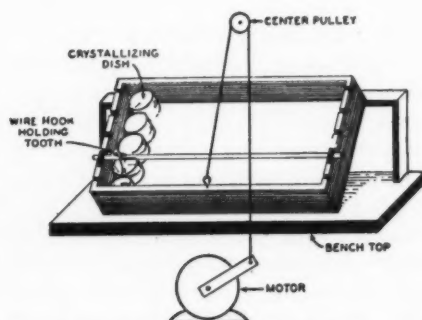


Figure 1 Diagram of *in vitro* calculus producing apparatus. Only five saliva containers are shown in position. The tray is hinged to the horizontal strip at back

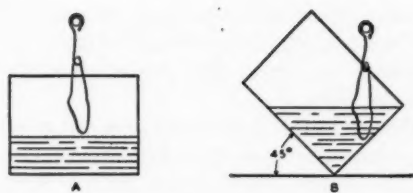


Figure 2 Detailed drawings showing change in the relative positions of the tooth crown to the saliva when (A) the tray is lifted to horizontal position and (B) when the tray is resting at 45 degree angle

studied simultaneously under identical experimental conditions.

The artificially formed calculus deposit, as with clinical calculus, is composed of inorganic salts deposited on an organic matrix. The major difference between these two sources of deposits appears to be the higher organic and lower inorganic content of synthetic material. In other words, the *in vitro* "calculus" is not as highly mineralized as the clinical calculus. On the other hand, the relative proportions of these two major fractions in the synthetic material remain remarkably constant from one experiment to another, and there is a pronounced similarity in the percentage composition of the major inorganic constituents between the natural and the synthetic calculus.

University of Pittsburgh School of Dentistry, Pittsburgh, Pa.

## ▼ Pharmacology

### Some facets of antibiotic therapy

W. R. O. Goslings. *M.Mundi* 3:1-14 Jan.-March 1957

Antibiotics have been used in medicine and dentistry for some time in the treatment of diseases caused by different types of pathogenic microorganisms. The high bactericidal effect of most antibiotics combined with their slight toxicity has probably been the main reason for their frequent, sometimes even indiscriminate, usage. Recently,

however, several reports in dental and medical literature on unfavorable side effects and increased resistance to antibiotics have aroused interest in the reverse side of the picture.

The appearance of antibiotic-resistant strains of microorganisms is an alarming phenomenon. It has necessitated the administration of larger and larger doses, and has created an increasing demand for newer and more effective antibiotics.

To overcome infections, at least ten times the average dose of penicillin is sometimes required now as was needed 11 years ago. In certain instances, simultaneous use of two or more antibiotics is required if bacteriologic tests have revealed that the infectious agent is resistant to a certain antibiotic but is susceptible to specific combinations.

The presence of antibiotic-resistant bacteria has resulted in an increasing difficulty in controlling infections, in a gradually increasing danger of operating in the presence of acute infection and an increased possibility of cross-contamination of wounds.

It can be assumed that bacteria causing infection of root canals especially will become more and more resistant to antibiotics.

The tissue reactions observed in patients who are sensitive to certain antibiotics justify a grave warning against the indiscriminate use of antibiotics, especially penicillin. The possibility of such reactions, however, does not constitute an obstacle to antibiotic treatment when the use of certain antibiotics is indicated and if proper precautionary measures are taken.

In the final decision as to which type of antibiotics should be used, or whether to administer antibiotics at all, the analysis can be made only on the basis of a complete evaluation of all the factors involved. The risk of unfavorable side effects, hypersensitivity, increased resistance to antibiotics and also toxic reactions must be weighed against the dangers involved in withholding antibiotic treatment.

The correct answer can be found only in the experience, biological knowledge, judgment and sense of responsibility of the individual dental or medical practitioner.

First Medical Clinic, University of Leyden, the Netherlands



# Physiology

## The dentist's faculty of smell

(Der Zahnarzt und seine Nase)

Walther Müller. *Zahnärztl. Welt & Reform*  
58:364-365 July 10, 1957

In dental practice, the dentist's ability to perceive odors and to distinguish between them is almost as important as his visual faculty. Before and during treatment, the dentist's olfactory system often comes in contact with various odorous particles of which he must be cognizant if he is to make the proper diagnosis and to avoid errors in medication.

It is generally assumed that the senses in man are inferior to those in animals. Recent research, however, has revealed that man's allegedly inefficient faculty of distinguishing odors sometimes recognizes certain fragrances more readily than the noses of most animals. The identification of fragrances of different perfumes, for instance, has increased in delicacy with the advancement of civilization. Odors have always played a significant part in the refinement of human life as noted by the esteem bestowed on the aromas of coffee, tea, fruits, tobacco or the bouquet of fine wine.

Minute chemical particles of various odorous substances excite man's olfactory system. Even when greatly diluted, enough of these particles are present to account for the perception and distinction of odors. In one billionth part of a milligram of mercaptan are about 200,000,000,000 molecules. Even if only a comparatively small number of these molecules enter man's nostrils, the molecules are dissolved in the mucous membrane covering the olfactory system and produce a nervous sensation which initiates smell.

The sense of smell, like that of taste, is a chemical sense, because chemical particles of odorous materials (in dilutions) activate the living olfactory cells.

Recognition of relatively delicate fragrances is mediated by the first nerve in contrast with the identification of irritants which stimulate the fifth nerve.

An effective cognizance of odors is important for human beings and animals. For certain professional men, among them dentists, it is almost indispensable.

When gaseous substances come in contact with the sensitive cells of the mucous membrane of the nasolacrimal duct, the perception of scent is conducted to the center of smell in the brain where the sensation is evaluated. In the brain and not in the nose, therefore, the true sensation of smell develops. For that reason, to the odorless nitrous oxide are added strong smelling substances which warn if the gas escapes during anesthesia.

The type of the complicated electrochemical impulse activated in olfactory cells determines whether the sensation perceived appears pleasant or unpleasant.

Recent studies have been made on the development of a "scentometer," which instrument is able to "smell" odors even in dilutions of 1:20,000,000,000. The scentometer will soon be introduced to research, medicine, dentistry and the public health service.

Römerhof, Zurich, Switzerland

## The site of the theoretical axis of rotation and the movement of the condyle in connection with different closing movements of the mandible

(Teoreettisen kiertoakselin sijainti ja nivelnastan liike alaleuan erilaisten sulkemisliikkeiden yhteydessä)

K. Nevakari. *Suomen hammaslääk.toim.*  
53:33-48 March 1957

The site of the theoretical axis of rotation and the amount of condylar displacement were studied in three closing movements of different types: (1) mandibular movement from rest position to centric occlusion; (2) from posterior opening position to centric occlusion, and (3) from posterior opening position to retruded contact position.

An attempt also was made to determine the mesiodistal difference between centric occlusion and the retruded contact position of the mandible in the sagittal plane.

The material consisted of 12 dental students with normal occlusion and physiologic function of the jaws. Their average age was about 22 years.

Lateral cephalometry was used, and measurements were made by the triangle transfer method described by Nevakari (1956).

As the mandible moves from rest position to centric occlusion, the geometrically constructed theoretical axis of rotation of the movement is behind and below the intercondylar axis, and thus the movement cannot be a pure hinge movement round the intercondylar axis.

In the movement from the posterior opening position to centric occlusion, on the other hand, the axis was found to be anterior and superior (ventrocranially) to the condyles. In only one student was the axis point situated within the condylar limits. Thus, even this movement is not a pure hinge movement round the intercondylar axis. The only movement of the mandible which seems to be a pure hinge movement is from the posterior opening position to the retruded contact position; in this movement the axis point was within the condylar limits in seven instances and in five instances it was near the condyle.

The amount of condylar displacement in the mandibular movement from rest position to centric occlusion varied from 0.2 to 2.5 mm., the median being 0.7 mm. In the movement from the posterior opening position to centric occlusion the displacement varied from 0 to -2.2 mm., with a median of -0.7 mm. The minus sign denotes that the direction of the displacement was forward or downward in mandibular closure, or opposite to the displacement in "physiological" closure. In the mandibular movement from the posterior opening position to the retruded contact position, condylar displacement was noted in only 5 of the 12 subjects, the range of variation being from 0.3 to 0.6 mm. In the remaining seven subjects the condyle performed a pure hinge movement.

In all subjects studied the retruded contact position was more distal than centric occlusion. The difference of these two positions in the mesiodistal direction, measured at the cuspid point, varied from 0.3 to 2.7 mm., the median being 1.0 mm.

*Fredrikinkatu 25, Helsinki, Finland*

### **Cineradiography of the temporomandibular joint**

John Osborne. *Internat.A.D.Res.Preprinted Abs.*  
15 March 21, 1957

By means of electronic image intensification, cinerontgenograms were taken during the functional masticatory movements of the temporomandibular joints. These films show the joint movements on the working side and on the balancing side during the mastication of (1) 1 cc. cubes of raw carrot and (2) Grapenuts. These substances were selected as representing, at the commencement of mastication, types of large and small boluses.

A subsequent frame by frame tracing analysis of the films of each patient reveals that the path of closure of the joint on the working side is inferior to the path of opening, at the commencement of mastication. After three or four cycles, the path of closure becomes practically the same as the path of opening. This phenomenon is thought to be caused by the size of the bolus which, if large, tends to be crushed by the molar teeth during the early masticatory cycles. This causes a hinge effect which lowers the condyle during the closing of the mandible. On the balancing side no variations between the path of opening and closure of the condyle are noted. These observations apply to patients who have complete natural dentitions. Patients with less posterior occlusal support display a haphazard type of joint movement during mastication of the same foods.

*University of Birmingham, Birmingham, England*

### **Muscles and the teeth**

W. J. Tulley. *Proc.Roy.Soc.Med.* 50:313-320  
May 1957

Some of the functions of the orofacial muscles are represented functionally at a much higher level in the brain than others. Activities such as swallowing are under voluntary control only in the first stage. Swallowing is a basic reflex behavior initiated even before birth, and changes cannot be readily established by exercises.

Activities such as speech have a high degree of cortical control. Some speech defects are caused by abnormal neuromuscular anatomy, but many are due to defects in learning. Mastication occupies a position between the function of swallowing and speaking. It can be compared with walking. Each individual develops a characteristic subconscious chewing "gait." This is built up on an underlying co-ordinating pattern in the nervous system but will vary considerably with the anatomic position of the teeth. Abnormal tooth position will be reflected in the masticatory pattern.

Normal and abnormal muscular activity in relation to the teeth can be investigated by clinical observation, by animal experimentation, by observation of the effect of pathologic conditions affecting muscle function, by cinefluoroscropy of the soft tissues and by electromyography.

The basic structure of the jaws develops according to a predetermined pattern. The potential for growth, however, cannot be determined at any particular time. Function has no effect on the basic growth of the jaws.

The development of the teeth with their alveolar process is influenced by the cheeks, lips and tongue. The relationship of upper and lower dental arches is determined by the size and relative positions of the basal elements of the jaws and reflects the shape, the resting position and activity of the soft tissues.

Upper respiratory infections and obstructions, although they often accompany malocclusions, cannot be shown to be the direct cause but only an associated factor. The narrow maxilla is inherited and is not due to lack of aeration of the antrums. Naturally narrow nasal passages are more easily obstructed, although it is possible to find this facial type without any history of upper respiratory troubles.

The posture of the mandible at rest is a so-called constant for the individual. In the infant the gingival pads are widely separated at rest but as the teeth and alveolus develop the interocclusal clearance diminishes to 2 to 3 mm. in the molar region. The normal path of closure from rest to occlusion is a simple hinge movement.

The changes brought about by age help the orthodontist, but also create new problems. The growth potential of the skeleton and soft tissues is

fulfilled and the maturation of the facial musculature results in the adult "mask." With the increasing worries of raising a family and of income tax, the adult does not retain the lax lip positions of childhood. The desire of the young lady to be attractive modifies the "deadpan" face of the preadolescent.

Because the neuromuscular system is affected by emotional states, some instances of facial pain may be due to spasm in the masticatory muscles. There is need for further work on the physiology and maturation of normal and abnormal orofacial muscular behavior.

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## Histology

### **Distribution of blood vessels in periodontal tissues of white rats**

(A distribuição dos vasos sanguíneos nas estruturas parodonticas do rato albino)

Sylvio Bevilacqua. *Rev. brasil. odont.*  
14:419-427 Nov.-Dec. 1956

India ink and a technic by which even the smallest vessels can be visualized were used in studying the vascularization of the teeth and their supporting structures. White rats were chosen as experimental animals because of the close resemblance between their molars and those of man. In the studies only the mandibles were used.

Examination of the serial sections, which were cut in the vertical, sagittal and horizontal planes with a microtome having a blade only 0.010 inch thick, showed that various kinds of vessels—ascending branches from the apical region, branches from the alveolar arteries, and descending branches from the gingiva—find their way to the pericementum and end there. The vessels are arranged in a kind of basketlike network in which the roots of the teeth are lodged, and the tortuous course followed by many of the vessels seems to indicate a mechanical or hydraulic dis-



position that makes possible the functional movements of the teeth. The countless vascular channels act as pathways by which inflammatory reactions may spread to the alveolar bone, and they almost certainly play a part in its resorption. The richness of the vascular supply supports the ideas expressed by Leriche and Policard in regard to the vascular resorption of bone. The physical and chemical changes that take place in the tissues during the inflammatory process probably provide an explanation of the mechanism by which the osteolysis takes place.

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## Biochemistry

### An investigation into the glycogen content of the gingivae

J. R. Trott. *D.Practitioner* 7:234-242 April 1957

The glycogen content of the gingiva at different periods of life, and in both sexes, was investigated histochemically to study the mechanism of estrogen action on the gingival tissues. Gingival biopsy specimens were obtained from 84 female patients in the three main age groups of interest: 10 children, 58 adults, and 16 adults over the age of 40 years, and from 31 men between the ages of 18 and 40 years.

In women it appears that there is no correlation between the deposition of glycogen in the gingival epithelium and its deposition in the vaginal epithelium. In the vaginal epithelium it is deposited in close correlation with the sexual phases in a woman's life, the glycogen deposition varying from childhood until after the menopause. This does not appear to be true in the gingiva, where glycogen deposition is not influenced by estrogen activity. There is no apparent difference in the glycogen distribution or concentration in male or female gingiva.

The hypothesis that glycogen is necessary for the production of keratin is hard to substantiate. In those regions in which normal keratin is

formed, glycogen is not present in any increased amount.

In the crest epithelium, where keratinization was often absent, glycogen was just as frequently present in quantities similar to the other regions.

There appears to be no relation between either the presence of glycogen or the concentration of glycogen and the degree of inflammation. Here the author disagrees with Dewar (1955) with regard to glucose diffusing into the epithelium from the inflammatory reaction and being stored as glycogen. Similarly, since glycogen was found in both clinically normal and pathologic gingiva in not dissimilar amounts or distribution, the hypothesis that glycogen may serve a protective function to protein degradation is hard to substantiate.

It would seem that glycogen is present in the gingival epithelium for some as yet unknown process of cell metabolism, and that the thickness of the epithelium or the degree of keratinization must depend on other factors.

There is no relation between the presence, concentration or distribution of glycogen and age, sex, phase of sexual life in women, or inflammation.

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### Oxygen uptake by normal and inflamed gingiva and saliva

Hans Karl Schrader and Renate Schrader.  
*Helvet. odont.acta* 1:13-16 April 1957

The oxygen uptake of healthy gingiva, inflamed gingiva and of saliva of the same subjects was investigated. The respiration of gingival tissue was determined manometrically by means of a Warburg apparatus.

Biopsies of inflamed gingiva showed an oxygen consumption 83 per cent higher than that of clinically healthy gingiva. The oxygen consumption of gingival epithelium is at least three times greater than the oxygen consumption of subepithelial tissue. The salivary oxygen uptake of persons with inflamed gingiva was 80 per cent higher than the salivary oxygen uptake of persons with normal gingiva.

*Dental Institute, Berne, Switzerland*



## Anthropology

### Examination of teeth and jaws of Stone Age man found in Sweden

(Odontologische Untersuchung von Zähnen und Kiefern des Menschen aus der Steinzeit in Schweden)

U. Holmer and A. B. Maunsbach. *Odont.Tskr.* 64:437-521 Jan. 20, 1957

Zoologists, paleontologists and anthropologists always have been interested in tooth and jaw remains of prehistoric man. The interest of the dental profession, however, has been limited to those aspects which bear on orthodontics. There are, however, many other aspects which should be of interest to dentistry.

A recent Swedish investigation concerns the finding of teeth and jaws of Stone Age man, particularly the remains of two individuals from the Mesolithic period and those of 557 men, women and children from the Neolithic period. The material examined includes all findings in Gotland (1947), Östergötland (1948), Västergötland (1948), Skane (1950) and Avastra (1956).

There were 49 intact skulls, 468 perfect, or insignificantly damaged, jaws, 6,402 permanent and 387 deciduous teeth.

With the radioactive carbon ( $C^{14}$ ) method, the age of the remains was determined as being about 8,000 years for Mesolithic man, and from 2,500 to 5,000 years for Neolithic man.

Although the primary purpose of the Swedish investigation was to determine the tooth and jaw conditions in the Stone Age man, evidence was found which unquestionably can be applied to the probable causes of oral diseases in recent man.

The conclusions reached were as follows:

1. Damage to tooth structures was not caused exclusively by dental caries.
2. Excessive and extensive attrition of tooth crowns had produced nonvitality in pulps.
3. Caries incidence was far lower than in recent man.

4. Tooth and jaw structures were of a better quality and contained a more favorable proportion of essential chemical elements which obviously is disproportionate in civilized man.

5. The incidental imperfection in the enamel formation was not identical with an acquired predisposition to caries.

6. The effect of an excessive carbohydrate consumption, invariably responsible for tooth decomposition and caries in recent man, was not observable in Stone Age man.

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## Psychology

### Diagnoses based on verbal expressions

(Diagnostik aus dem sprachlichen Ausdruck)

D. Langen. *Deut.med.Wschr.* 82:1006-1009 June 21, 1957

At the Neurologic Clinic of the University of Tübingen, Germany, 300 case reports from dental and medical practice were studied, in which the descriptions of patients' complaints and subjective symptoms had led to inaccurate diagnoses.

It was established that patients with organic diseases usually are able to describe their complaints in a brief, matter-of-fact manner.

Neurotic patients, however, often give verbose, circumstantial and emotionally altered descriptions, emphasizing unimportant external events. These patients are unable even to answer simple questions such as "which tooth hurts?". Their answers tend to point toward central neurotic complexes. In some neurotic patients this centering on a certain complex is absent, but they also tend to describe their complaints in terms of outside events.

A similar link to external conditions characterizes depressive patients. Usually, their remarks are brief but they tend to emphasize abnormal aspects in their descriptions. In contrast to the last group, verbal expressions of manic patients often reveal flights of vague

ideas (escapism), and their descriptions of subjective symptoms usually abound in words.

Using these various patterns as a basis, practicing dentists and physicians are able to explore in a simple manner the genuine subjective symptoms and perceive better the objective symptoms to make the proper diagnosis.

A careful observation of the patient's speech behavior and verbal expression, therefore, will help to avoid inaccurate diagnoses, and will be helpful in the determination of the nature and course of the disease.

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## Pathology

### Dental surgery and the diabetic patient

Henry Mandiwall. *D.Practitioner* 7:255-256  
May 1957

It is important that the dentist should recognize the presence of diabetes in a patient on whom he is going to operate, no matter how small the surgical procedure, because of certain risks.

The onset of symptoms of diabetes is usually insidious, and the disease is sometimes only discovered by chance examination of the urine. The commonest symptoms are the passage of excessive amounts of urine, excessive thirst, fatigue and loss of weight. Other infections may be present, such as carbuncles, boils and stys.

The oral manifestations may be periapical or periodontal abscesses, dryness and burning of the tongue with enlarged fungiform papillae, and, in the later stages, the sweetish characteristic odor of acetone in the breath. Dental infections always make the diabetic state worse and may produce manifest symptoms in a patient in whom the disease may previously have been latent.

There are no specific changes in the mouth resulting from diabetes, although where no treatment is given the patient, periodontal disease may develop. The age group of such patients is usually between the fourth and fifth decade of life, when the incidence is the highest, but the

disease can occur at any age. In patients in whom diabetes is suspected, urine examinations and blood sugar estimations will establish the diagnosis. If the dentist suspects that his patient has diabetes which has not yet been diagnosed, he should refer the patient to a physician for confirmation of the diagnosis before undertaking further dental treatment.

Any oral surgery should be carried out under the joint supervision of a dentist and a physician in a hospital. For the patient whose diabetes is controlled by diet alone, dental surgery is usually best undertaken in the morning without any food having been taken beforehand by the patient. For the patient on insulin, the best time would be two to three hours after the morning insulin injection, allowing for a normal breakfast. The alternative is to give dental treatment early in the day and postpone the patient's usual routine insulin and meal by a few hours until such treatment has been given.

As the insulin is balanced in its action against the intake of food during the day, it is important that the patient not miss a meal. If he does have to miss a meal because he is unable to chew, he should take the equivalent food value of the meal in liquid form. The management of the diabetes is much easier when local anesthesia, rather than general anesthesia, is used. Postoperative complications will be minimized if vitamins B and C are given, together with antibiotics. Ascorbic acid in 100 mg. doses three times a day commencing a day before the operation will prevent a lot of trouble. The surgery must be as atraumatic as possible.

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### Mechanism of enamel caries

T. B. Coolidge, M. H. Jacobs and F. C. Besic.  
*Internat.A.D.Res.Preprinted Abs.*  
11 March 21, 1957

The problem in investigating experimentally the mechanism of early clinical caries of the enamel has been to find a sufficiently precise, systematic and general description of the changes in enamel so that experimental procedures could be shown to duplicate the clinical features. The method

employed has been to find and confirm a systematic and precise description (that of Nishimura) of early clinical caries and has consisted further in demonstrating that the features described by Nishimura can be reproduced exactly by exposing enamel to solutions of defined composition.

The novel feature of the present report consists in the observation of a representative number of early clinical lesions of occlusal surfaces with ordinary and polarized light with the resultant finding that the early stages of clinical caries of the occlusal surfaces have the same features as those described by Nishimura for smooth surfaces. The description of Nishimura is general, that is, it holds for the greater part of early clinical caries. The principal features of early clinical caries of the enamel of both smooth and occlusal surfaces are due to definable changes in the concentrations of hydrogen ions and of calcium and phosphate at the enamel surface.

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#### **Gastrointestinal polyposis and pigmentation of the oral mucosa (Peutz-Jeghers syndrome)**

Charles J. Staley and Henry Schwarz.  
*Internat. Abs. Surg.* 105:1-15 July 1957

In 1949 Jeghers, McKusick and Katz outlined an obscure but previously described syndrome consisting of "generalized intestinal polyposis and melanin spots of the oral mucosa, lips and digits." Prior to 1949 only 12 proved and 9 possible cases were known to exist. Jeghers and others described its occurrence in ten patients, and since then at least 52 more instances (including those of the authors) have been recorded. Scarcely a month passes that at least one additional instance cannot be found discussed in the current journals; it seems certain that in many patients, the condition is unrecognized.

The knowledge that such a syndrome exists should provide the solution to the diagnostic problem of abdominal pain or intestinal obstruction.

Of the 52 patients comprising this report the youngest was 4 years old and the oldest was 77. Thirty-four of the patients (65 per cent) were between the ages of 10 and 29 years. Twenty-five

patients had had symptoms for less than five years, ten patients had had symptoms for from 5 to 9 years, five patients for from 10 to 14 years and five patients for 15 years or more. The age of the patient at the time of potential diagnosis is usually considerably lower than the age at which the diagnosis is established. The age at onset of the symptoms varied from several weeks to 77 years. In the group reviewed there were 24 females and 28 males.

In 23 (44 per cent) of the 52 patients there was a positive family history of either spots, polyps, or both.

The majority of the patients had relatively dark skin, hair and eyes but this is neither an essential nor constant feature of the syndrome.

The presence of melanin spots about the mouth and face is an outstanding feature of the syndrome. The characteristics of the spots vary little. They are generally small, rarely exceeding 5 mm. in diameter and ordinarily are considerably smaller. They are maculas with well-delineated margins and little tendency to coalesce although they occur in close proximity. The color has been described as every conceivable shade of gray (black) and brown, and occasionally a somewhat bluish cast is noted. Those occurring on the skin are almost invariably a shade of brown, whereas those involving the mucosal surfaces more frequently assume a grayish tint. The spots are usually round or oval, but an irregular form is occasionally noted, especially in the oral mucosa.

The most common location is the mucosa of the lip and oral cavity; this is an almost constant feature of the disease. There were pigmented spots on the lips in almost every instance. Some portion of the oral mucous membrane was involved in all but six patients. The area of pigmentation within the mouth varies. The most common site is the buccal mucosa; the gingiva and palate are involved with less frequency, and the tongue and floor of the mouth but rarely. The lower lip is more frequently and more prominently pigmented than the upper, the visible portion being involved less frequently. The presence of pigmentation has been noted during the first few years of life in almost every instance.

The symptoms referable to gastrointestinal polyposis are largely those of small bowel intussusception. Periodic abdominal pain is the chief



complaint in practically all patients, varying from minimal cramping discomfort to excruciating pain. Anemia and the associated pallor and weakness are not uncommon and may represent the patient's chief complaint.

The most common site of polyps in this disease is the small intestine. No segment of the gastrointestinal tract which is lined with glandular epithelium has escaped involvement in the poly-poid process. Of the 52 patients reviewed, all but three have been subjected to abdominal surgery. In the small bowel, treatment should be limited to the removal of symptomatic polyps. All polyps which are obviously producing intussusception should be removed, as should all polyps measuring 1 cm. or more. Treatment should include a thorough investigation of all members of the patient's family.

The ultimate prognosis in this disease is not yet available. An air of guarded optimism seems justified in most instances.

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### **Tuberculosis and the dentist**

P. S. Woodruff. *Austral.D.J.* 2:61-66 April 1957

Dental disease in persons with tuberculosis has a twofold importance. It may interfere with general nutrition, and therefore with resistance, and it contributes directly to much bronchopulmonary pathology. There are good reasons for remedying dental disease as soon as possible in tuberculous patients.

If a known tuberculosis patient is to be operated on by the dentist, the dentist should consult the patient's chest physician; if general anesthesia is necessary, an anesthetist should be employed who is used to handling thoracic patients.

What danger from the tuberculous patient is there to the dentist? If the dentist is of sound hereditary constitution (particularly with regard to resistance to tuberculosis), is careful to inhale

only small doses of tubercle bacilli, and is of mature age, in good general health and has either previously resisted a natural tuberculous infection or has been vaccinated with BCG, he is not likely to come to harm.

It is not the known tuberculous patient, however, who is the danger. Such a patient has been taught how to safeguard others, and the dentist treating such a patient naturally would redouble his precautions. It is the unknown sufferer or the man who will not tell his dentist that he has tuberculosis who is the danger.

The danger of infection from a tuberculous patient to other patients must also be considered. In the waiting room there is some risk of droplet infection, and probably some slight risk of ingesting tubercle bacilli when licking the thumb preparatory to turning the pages of a magazine. But these are normal hazards of moving in public and semipublic places.

After the dentist has treated a known tuberculous patient, every instrument which has been in or close to the mouth, including the handpiece, must be sterilized. Tubercle bacilli are sensitive to heat, and even 140° F. for 20 minutes will kill them. They are rapidly killed by boiling water. Inasmuch as each dentist will have one unknown tubercular patient in his chair each year, it seems reasonable to carry out the same precautions after each patient.

The tuberculous dentist is much more a menace than the tuberculous patient. At least 80 times a week such a dentist would be placed in the most advantageous position for spreading tuberculous infection to one of his patients. Infected droplets are relatively heavy. They travel forward and downward in a sharp curve. The patient's open mouth is placed just where the most heavy contamination would occur. Young patients, especially, would inevitably become infected, some would become seriously ill and some would probably die. An annual chest roentgenogram is a necessity for every dentist.

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## Prosthetic dentistry



### Crown and bridge

#### Recent advances in crowns and bridges

A. G. Vermeersch. *Internat.D.J.* 7:238-259  
June 1957

In the world literature of the past five years dealing with crown and bridgework, there has been a stress on biomechanical problems and a regard for the biological integrity of the tissues which are to act as a mechanical support for the prosthetic restoration.

The metal crown increasingly is considered the best bridge retainer and the best restoration for teeth which are grossly carious. Most authors recommended the full cast crown. Boitel (1954) has improved its technic. To obviate the disadvantages of the contraction of gold after cooling, he carries out his casting in two stages, first a cap and then the body of the crown. The two-piece crown with fitted ring still finds favor in Europe.

Porcelain has largely replaced resin in the jacket crown, because of the former's advantages as to esthetics and stability.

The mixed metal-plastic crown is in the process of evolution, and many innovations have been proposed. Practitioners have seen in this restoration a means of combining esthetics with strength. The future belongs to this kind of prosthesis, both in individual restoration and in the construction of bridge retainers. The main difficulty is that of attaining perfection in coloring, since gold tends to show through the thin layer of acrylic resin. Most authors have asserted that the best method of eliminating the reflection from the gold is to pass it through an electrolytic bath of pink tinted 24 carat gold.

Inlays, onlays and overlays remain in firm favor with many practitioners. LeHuche's work (1953, 1954, 1955) on this subject is widely recognized for its clarity and accuracy.

The two most important works on bridges published in Europe during the last five years are by Jeanneret (1953) and Karlström (1955). These two books deal with methods of obtaining parallelism for the construction of large bridges, the first recommending the "isodrome," the second the "pontostructor." The common point of departure is the use of "spiked" inlays and pinlays as methods of anchorage, with the aim of sparing the dental tissues as much as possible.

Although many authors have proposed original methods of making removable bridges, this type of bridge has not supplanted the classic fixed bridge. American authors prefer the fixed bridge, with full shell crowns and veneer crowns as retainers. Many authors recommend casting the bridge in a single piece, without the use of solder.

Plaster remains the favored impression material for bridges despite the evolution of new products such as alginate, hydrocolloid and synthetic elastomers.

The temporary bridge has several advantages: it is useful esthetically, it protects the gingiva and it is a space maintainer.

Louvain, Belgium

#### Acrylic resins in the construction of crowns

(Couronnes à maske de résine acrylique)

L. Boutroux and J. P. Vizioz. *Encycl.med.chir.* 27:23267-23277, 1957

The use of acrylic resins in prosthetic dentistry has become more and more extensive. Clinically, acrylic restorations have proved to be biologically compatible if the teeth are prepared properly and if the crowns conform to the same physiologic and mechanical requirements as do the standard types of porcelain-faced cast gold crowns. It has been established that the absorption of water by acrylic materials does not react unfavorably on the contiguous tissue.

Some authors have reported on the tendency of acrylic-faced cast gold crowns to become easily stained. Such a discoloration, however, could have been caused by improper processing.

Acrylic resins are not adequately resistant to abrasion if they are opposed by ground natural

or artificial teeth which have insufficiently smooth occlusal surfaces. In not a single instance have acrylic-faced cast gold crowns, in contact with other acrylic, porcelain or metal restorations, undergone significant material changes or shown extreme mechanical abrasion.

The favorable behavior of acrylic-faced cast gold crowns in the oral cavity under applied stress has had a decided influence on the applicability of acrylic resins as prosthetic materials.

Clinical experience has demonstrated that acrylic resins possess the necessary toughness and resistance to impact forces.

All brands of acrylic resins tested, however, have certain limitations. The correct approach to the use of these comparatively new materials for crown constructions, therefore, is not to use them indiscriminately as replacements for all previously used prosthetic materials, but to determine carefully by scientific study and clinical observation the applicability of acrylic resins in the construction of acrylic-faced gold crowns and of hollow, jacket and veneer crowns in each instance.

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### Complete dentures

#### Healing of extraction wounds after insertion of immediate dentures

(Die Heilung der Extraktionswunde unter der Sofortprothese)

Wilhelm Meyer. *Deut.Zahnärztebl.* 11:444-445  
July 8, 1957

Although immediate dentures are not indicated in all instances, the use of partial or complete immediate dentures is recommended in instances in which harmful effects such as collapse of facial muscles, closing of the bite or disturbance of the esthetic appearance of the face may occur if the patient has to wait until the tissues are healed sufficiently to permit insertion of permanent restorations.

Histologic examination of specimens taken eight hours, one, two or three days and one to two weeks after multiple tooth extractions followed by insertion of immediate dentures shows clearly the different stages of the healing process.

Decrease of the postoperative swelling and irritation of epithelial and connective tissues adjacent to alveolar margins are the first signs of the beginning healing process. The periosteum remains firm even when hyperemia occurs. On the floor of the empty socket, ruptured Sharpey's fibers and injured small blood vessels adhere to the coagulum and fill the alveolus almost immediately after extraction.

Within the next 24 hours, the wound is covered with a gray-white layer formed by leukocytes. This accumulation produces a temporary and relatively compact sealing for the wound, an important phase of the healing process which should not be disturbed.

Epithelization is produced by basal cell layers of epithelial tissue of the gingival margin, and is usually completed within one week.

Beginning at the osseous structures of the lateral alveolar walls, granulation takes place. Sequestrums remaining in the socket are quickly enclosed by epithelial cells, decomposed and eliminated.

After three weeks, the alveolus is narrowed by cicatrization, and newly formed osseous tissue appears.

Suturing the wounds after tooth extraction and before insertion of immediate dentures accelerates the healing process.

The construction and insertion of immediate dentures are comparatively simple procedures. Although sometimes immediate dentures are intended only to serve as temporary substitutes, they have significant functions.

In addition to the advantage in accelerating the healing process, immediate dentures reduce hemorrhages by aiding the coagulation and by stimulating a quicker deposition of new osseous tissue to fill the alveolus, by helping marginal tissues to mold into the desirable retentive form, and by aiding the patient in becoming accustomed to wearing dentures.

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# **Preventive and public health dentistry**



## **Caries etiology and control**

### **The tale of two Minnesota cities**

William A. Jordan. *North-West Den.* 36:219-222  
July 1957

The annual Austin dental survey was designed in part to measure any change in dental caries incidence that derives from the fluoridation of the water in Austin, Minnesota, which was begun in 1952 and discontinued by referendum in March 1956. In February 1957 about 4,140 pupils in kindergarten through the sixth grade were examined. Four hundred and seventy-three five year old pupils had an average of 4.93 def teeth. This represents a 22 per cent reduction in caries as compared with the 1952 examination.

The average DMF rate in the permanent teeth of each age group, 6 through 12 years old, shows a continued decline in the incidence of caries. The value of the fluoridation program has been demonstrated without question. The six year old children show a 71 per cent reduction in dental caries of the permanent teeth when results of the 1957 examination are compared with those of the 1952 examination. The seven year old children show a 40 per cent reduction and the 12 year old children show a 27.5 per cent reduction.

The present status of the situation in Austin presents an interesting study for the researcher. When will the caries rate begin to reverse and increase since the discontinuance of the fluoride in the water? Austin will not be urged to re-establish its fluoridation program for several years, but Austin dentists will be urged to continue their annual dental survey of the school children.

Hutchinson is one of 37 communities in Minnesota which have adopted and maintained the program of fluoridating the community water supply. In April 1957 a follow-up survey of Hutchinson school children was made; 839 were classed as town residents and 711 as rural. Rural students

have access to fluoridated water during school hours and while in town.

The town residence children show a 41 per cent reduction in tooth decay for those six years old, 20 per cent for age seven, 25 per cent for age eight, 15 per cent for age nine, 6 per cent for age ten, and 4 per cent for age 12.

The rural group shows a 49 per cent reduction in tooth decay in the six year old group, 22 per cent for age seven, an increase in tooth decay of 1 per cent for age eight, a 12 per cent reduction for age nine, and 1.8 per cent for age ten. The number of students in the younger age group (six to ten years) was small and does not give a true picture. There are indications, however, that the rural students have obtained some benefit from the fluoridated water in the city.

The town residence student ages 5 to 18 show an average DMF rate of 5.01, whereas the rural students show an average of 7.75 DMF teeth for the same age groups in the 1957 survey.

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### **Comparative microflora of developing dental plaques in caries-immune and susceptible individuals**

Gordon E. Green, Matthew C. Dodd  
and Helen S. Inverso. *J.D.Res.* 36:331-337  
June 1957

This study extends previous observations that the most outstanding difference in the salivary flora of caries-immune and caries-susceptible individuals is in the number of lactobacilli.

The young adults used as subjects were classified as caries-immune or caries-susceptible on the basis of past caries activity. A dental scaler was used to remove the dental plaque material from the molar and bicuspid interproximal regions, the material was shaken loose from the scaler into a tube containing sterile saline, and the plaque material was dispersed into the suspending medium by ultrasonic agitation in the focal point of a Brush ultrasonic generator using a hemispherical transducer. Common bacteriologic media were used for qualitative studies of plaque microflora. Streptococci, micrococci and lacto-

bacilli were selected for enumeration because of their number and their possible importance in the acidogenic theory of caries.

The most striking difference between caries-immune and caries-susceptible individuals was the low lactobacillus count in plaques of caries-immune subjects with low salivary lactobacillus counts. The typical caries-immune subject has few or no lactobacilli in saliva or plaques. Plaques from those few caries-immune subjects with high salivary lactobacillus counts resembled plaques in caries-susceptible subjects.

There is a difference in the rate of increase of several types of organisms, including lactobacilli, in the developing plaques of caries-immune and caries-susceptible individuals. The data indicate that in caries-immune persons with low or negative salivary lactobacillus counts, the mechanisms responsible for this condition may also affect the organisms in dental plaques.

The results seem to associate lactobacilli more positively than the other types of microorganisms examined with caries activity.

*Dental Research Laboratory, Ohio State University, Columbus, Ohio*

#### **Rate of urinary fluoride output in normal adults**

Isadore Zipkin and Nicholas C. Leone.  
*Am.J.Pub.Health* 47:848-851 July 1957

Samples of urine were collected at ten intervals during a 24 hour period from eight normal adults drinking water containing 1 ppm fluoride and receiving in addition a single "challenge" dose of 5 mg. fluoride as sodium fluoride in 200 ml. of water. The total fluoride output after each time interval was compared with that found at a similar time during the previous 24 hour period (control day) when only drinking water with 1 ppm fluoride was ingested.

After 24 hours, 65.1 per cent of the fluoride ingested during the control day appeared in the urine. During the test day, only 54.1 per cent of the fluoride ingested appeared in the urine.

Fluoride was eliminated with the greatest rapidity during the first hour after ingestion of the "challenge" dose of 5 mg. fluoride. Thereafter the elimination rate dropped rapidly for

an additional eight hours and then approached the rate of 0.1 mg. per hour observed during the control day.

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#### **Influence on salivary sugar of certain properties of foodstuffs and individual oral conditions**

Lisa Swendander Lanke. *Acta odont.scandinav.* 15, Supp.23:5-156, 1957

It was considered of interest to study the difference in the sugar elimination rate of different persons. If this was found to be an individual property not varying from one type of food to another, it might help to explain the wide individual variation in the caries activity in different persons on the same diet.

Standardized chemical methods were used to study (1) the influence of different foodstuffs on the sugar content of the saliva when the foodstuffs were given in quantities containing equal amounts of carbohydrates; (2) the factors influencing the effect of different sorts of bread on the salivary sugar; (3) the sugar elimination of different subjects after consumption of the same foodstuff, and (4) the factors possibly influencing the sugar elimination rate in different subjects.

The subjects were 22 nurses and clerks at Vipeholm Hospital, Lund, Sweden. Certain foodstuffs were studied in all 22 subjects, whereas some special studies were made in a smaller group of 12 subjects. The salivary sugar concentration was determined after ingestion of different sorts of starchy foodstuffs and of sweets.

The following observations were made:

1. When the influence of different foodstuffs was determined by comparison between the mean salivary sugar level of a number of subjects, significant differences were found only between a few foodstuffs.
2. On comparison of the foodstuffs by differences calculated for each person, differences were demonstrable for a larger number of substances.
3. After the ingestion of foodstuffs the salivary sugar concentration is an exponential function



of time, that is, the logarithm of the salivary sugar values as a function of the time is a straight line.

4. Chewing gum caused an enhanced salivary sugar level over a longer time than the other sweets ingested.

5. Potatoes produced an enhanced salivary sugar level over a shorter time than the other starchy products.

6. Macaroni gave an enhanced salivary sugar level over a shorter time than the various types of bread.

7. White rye bread enhanced the salivary sugar level during a longer time than the other types of bread investigated.

8. Brown rye bread and hard bread (both of whole meal) gave an enhanced salivary sugar level over a shorter time than the other types of bread studied.

9. New wheat bread produced an enhanced salivary sugar level over a shorter time than stale bread of the same sort.

10. Unsweetened bread caused an enhanced salivary sugar level during a time equally as long as a sweetened bread baked according to the same recipe but with sugar added. Both regarding sugar content and other properties the sweetened bread was equivalent to the type of bread mainly consumed in Sweden.

11. Bread baked with proteins added to the flour gave an enhanced salivary sugar level over a shorter time than did bread made with the same flour but without proteins added.

12. The differences in salivary sugar levels between different persons after the ingestion of the same foodstuff were greater than those in the same person after ingestion of various sorts of bread and sweets (except chewing gum).

13. The effect of slow elimination in a subject appeared especially during "chain eating" of lozenges. Even when the amount of carbohydrates ingested at a time was small, the salivary sugar level remained elevated for a long time.

14. A factor with a pronounced influence on the course of elimination was the movements of lips and tongue after the substance had been swallowed. A high frequency of such movements gave a low salivary sugar content but the relationship was not linear.

15. Other factors which tended to accelerate sugar elimination from saliva were high frequency of chewing movements before the food was swallowed, rapid salivary flow and low viscosity of saliva and also a high activity of amylase in the saliva.

*University of Lund, Lund, Sweden*

# **Effect of topically applied agents on enamel. II. Influence of storage on the stability of fluoride solutions**

E. Hals, T. Mörch and P. Torell.

*Acta odont.scandinav.* 15:115-120 May 1957

An investigation was made of the effect of storage on the stability of fluoride solutions. The original composition of the solutions could not be maintained in glass bottles, glass bottles coated with paraffin, or in polyethylene bottles. The solutions were kept most stable, however, in polyethylene bottles.

Even a short period of storage makes it very difficult to maintain the initial composition of fluoride solutions. Reports from clinical investigations indicate that the pH value of a sodium fluoride solution to a certain degree determines the caries-prophylactic effect, as acid solutions seem to be less caries-inhibiting than are neutral solutions.

For clinical work of routine character it may be justifiable to use fluoride solutions kept for a short time in polyethylene bottles which repeatedly have been treated with acid and neutral sodium fluoride solutions. Tests show a substantial decrease in determinable iron after such treatment.

*Josefinegatan 32, Oslo, Norway*

# **Determining optimum fluoride concentrations**

Donald J. Galagan and Jack R. Vermillion.

*Pub.Health Rep.* 72:491-493 June 1957

The following formula, which takes into account variations in environmental temperature, is suggested for determining optimum fluoride concentrations for community water supplies:

$$\text{ppm of fluoride} = \frac{0.34}{E}$$



The figure 0.34 (optimum water consumption) was calculated from data for an area (Maywood and Joliet, Ill.) where the optimum fluoride concentration is known. E is the estimated average daily water intake for children through ten years of age in ounces per pound of body weight. It may be calculated from the estimation equation  $E = -0.038 + 0.0062 \text{ temperature}$ , where temperature is the mean maximum temperature in degrees Fahrenheit.

A table is presented showing suggested optimum fluoride concentrations for communities with five-year mean maximum temperatures of from 50° through 90.5° F.

*Public Health Service, Washington, D.C.*

#### **Experimental caries produced in ten days** (Caries experimentale en dix jours)

T. M. Marthaler and H. R. Mühlemann.  
*Zahnärztl. Praxis* 8:6-7 June 1, 1957

Experimental caries can be produced in caries-resistant and caries-susceptible strains of rats in periods as short as ten days. This was proved by experiments carried out at the Dental Institute of the University of Zurich, Switzerland.

In the short period studies, the caries-inhibitory effect of stannous fluoride and sodium fluoride did not appear to differ from that observed during the long period studies under circumstances that otherwise were identical.

The short period studies permitted the development of a new experimental procedure in which the caries inhibitor was added to the drinking water, and the rats were fed a non-cariogenic diet. The period extended from weaning to the age of 30 days. The first and second molars were influenced topically by the caries inhibitor, whereas the third molars were influenced systemically during the final stage of calcification.

During the second experimental period, no inhibitory agents were administered, but a cariogenic diet was given. After 10 to 25 days of observation, and the administration of 100 ppm stannous fluoride, carious destruction was noted in the first and second molars.

The high concentration of this caries-inhibitory agent seems to have no beneficial systemic influ-

ence on the resistance to caries in the teeth treated. In the control group, the third molars proved to be far more resistant to experimental caries than the third molars in animals treated with the inhibitory agent.

*Zürichbergstrasse 4, Zurich 28, Switzerland*

#### **Relative caries-inhibiting value of topically applied sodium silicofluoride and sodium fluoride: final report on a two year study at Mound, Minnesota**

John K. Peterson and W. A. Jordan. *J.D.Res.*  
36:124-128 Feb. 1957

Six hundred and ten children were divided into three groups and given one, two or four treatments of 0.9 per cent sodium silicofluoride in one side of the mouth and four treatments of 2 per cent sodium fluoride, or no treatment, on the opposite side.

The caries incidence in the second year of the study corroborates the results after one year. Two topical treatments of 0.9 per cent sodium silicofluoride probably reduced the caries incidence by about 15 per cent in the two years of the study. More DMF teeth and surfaces developed with both one and four treatments of sodium silicofluoride, than with four treatments of sodium fluoride. Although the superiority of sodium fluoride was not statistically significant, it should be safe to assume that sodium silicofluoride is not more effective than sodium fluoride as a topical treatment in the prevention of dental caries.

*Minnesota Department of Health, Minneapolis, Minn.*

#### **Effects of saliva on the acidity of dental plaque**

L. S. Fosdick, H. R. Englander and K. C. Hoerman. *Internat.A.D.Res.Preprinted Abs.* 40  
March 21, 1957

Caries-rampant and caries-free men, average age 18 years, were selected by means of clinical and roentgenographic examinations and lactobacillus counts. Men with rampant caries had at least ten teeth with extensive caries. Subjects with no

caries had no dental restorations and lactobacillus counts of zero. For each subject, dental plaque pH determinations were made with a Coleman vacuum tube potentiometer before a ten second sucrose (50 per cent) oral spray and at 5, 10, 15 and 20 minutes after receiving the spray. At each time interval two plaque pH determinations were made, one each from the buccal surface of the upper right and left molars. In most instances, plaque was removed from the same surfaces of the same teeth.

Each subject returned at the same time on the following day, and parotid caps were placed on the right and left Stensen's ducts to prevent parotid saliva from washing over the dental plaque on the upper molars. Strong suction was also used to prevent the submaxillolingual saliva from reaching the upper molars. Plaque pH determinations were then made in a manner similar to those obtained on the previous day. It was thus possible to compare the effect of saliva on plaque pH readings in the same individuals after sucrose sprays.

All individuals produced higher plaque acidities without saliva during the 20 minute interval. In many instances, elimination of saliva was followed by a reduction of more than 1 pH in plaque pH compared with the pH determinations with unrestricted salivary flow. Plaque acidities did not approach the prespray levels attained with the action of saliva.

*Northwestern University School of Dentistry, Chicago, Ill.*

#### **Climate and fluid intake**

Donald J. Galagan; Jack R. Vermillion;  
George A. Nevitt; Zachary M. Stadt  
and Ruth E. Dart. *Pub.Health Rep.*  
72:484-490 June 1957

Interest in the physiological response of children to climate increased substantially with the advent of fluoridation of community water. It has been suggested that less than the optimum level of 1 ppm of fluoride may be sufficient to give optimum protection in warm areas because of increased water consumption.

Records of fluid intake for 455 children in Antioch and Brentwood, Calif., from infancy

through ten years of age were obtained during 39 five-day observation periods in one year. Detailed temperature and humidity data also were obtained throughout the year.

Humidity was associated negatively with temperature to such a high degree that it was not possible to determine whether humidity might have some additional effect on fluid consumption in areas where high temperature and high humidity occur simultaneously.

Fluid intake per pound of body weight was highest among infants and decreased with age. There were no substantial differences between boys and girls in the amount of fluid consumed per pound of body weight.

Under normal living conditions, water intake increased directly with increases in temperature.

*Public Health Service, Washington, D.C.*

#### **Effect of varying levels of DL-tryptophan in diet on dental caries in rats**

Wolfgang Buttner and Joseph C. Muhler.  
*Proc.Soc.Exper.Biol.& Med.* 95:309-311  
June 1957

Rats were fed varying levels of DL-tryptophan as a constituent of a cariogenic diet, and the dental caries experience was studied.

When either 0.6 or 1.8 Gm. per kilogram of tryptophan was added to the diet, the increase in dental caries was not significant. When the diet contained 5.4 Gm. per kilogram of tryptophan, a significant increase in the incidence of dental caries occurred. Concomitant with the increased dietary tryptophan level was an increased salivary tryptophan concentration.

*Indiana University, Bloomington, Ind.*

#### **The effect of fluoride on the solubility of tricalcium phosphate in weak acids**

R. W. Moncrieff. *Brit.D.J.* 102:488-492  
June 18, 1957

A study was undertaken to investigate the effect of small quantities (from 0.2 ppm upward) of fluoride on the loss of calcium from calcium phosphate immersed in slightly acid solutions at body

temperature. The calcium ions present in the solution were detected by the gelling of sodium alginate.

The presence of 1 ppm fluoride, under suitable conditions, inhibits the ionization of calcium from the calcium phosphate and accordingly prevents gelling.

The presence of fluoride even in such a small proportion as 0.2 ppm has an easily observable inhibitory effect on the formation of calcium ions.

The experimental results support the view that the protective action on teeth of fluoride in water is due to a reduction of the solubility of inorganic matter in the enamel of teeth in slightly acid solutions.

#### **Indium nitrate as related to dental caries: a study in vitro**

Per Torell. *Acta odont.scandinav.* 15:159-173  
May 1957

After *in vitro* experiments, Lazansky (1947) and Manly and Bibby (1949) concluded that topical applications of indium nitrate increased the acid resistance of dental enamel. Experiments *in vivo*, however, gave different results as Lazansky noted increased caries experience in hamsters fed a cariogenic diet, if the teeth of these animals were brushed three times a week with indium nitrate.

It was decided that a detailed study should be made of the reactions between dental enamel and indium nitrate to determine, if possible, the reasons for the discrepancy in the results obtained *in vivo* and *in vitro*.

Five experiments were conducted involving: (1) the exposure of dental enamel at pH 1.7 to indium nitrate solutions for from 2 to 12 hours; (2) the exposure of dental enamel at pH 1.92 to indium nitrate solutions containing calcium and phosphate ions; (3) the exposure of dental enamel at pH 3.2 to indium nitrate solutions; (4) the exposure of dental enamel to indium nitrate in the milieu of saliva, and (5) the hydrolysis of indium phosphates.

The results indicate that indium nitrate solutions destroy enamel. It is concluded that acid solubility tests based on a comparison of the loss in weight of treated and untreated samples of

enamel powder cannot be utilized when solutions are employed which contain indium ions or other ions forming hydroxides of low solubility products.

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#### **Caries research in laboratory animals**

Reidar F. Sognnaes. *New England J.Med.*  
256:1226-1230 June 27, 1957

In recent years many investigators in different laboratories have been able to reproduce carious lesions in otherwise seemingly normal laboratory animals, selected from otherwise healthy stock and raised on diets complete in all nutrients currently recognized as being essential to growth, reproduction and general health. These lesions of the teeth have been produced by purified or synthetic diets of precisely known composition. Thus, investigators now have within their reach a tool with which to study various modifying influences of both endogenous and environmental factors, of known dietary components and of other elements of peculiar importance to the teeth.

It has been demonstrated that the carious process is a complex one. At least half a dozen factors have been brought to light that have a direct and indirect influence on the carious process: genetic, nutritional, dietary, salivary, endocrinal and bacterial. Experimentation in laboratory animals has offered more precise evidence that the presence of oral microorganisms and certain food substrates, especially carbohydrates, is essential for the initiation of dental caries. Recent work has conclusively demonstrated the importance of the saliva in relation to caries. Particularly, it appears that a normal salivary environment during the initial period of tooth eruption has an important bearing on the future susceptibility to caries, possibly through an influence on maturation of the teeth.

It is becoming increasingly evident that the susceptibility to decay can be modified significantly, depending on the earlier history of the animals. The early dietary history of the animals, before the teeth erupt, significantly influences the subsequent susceptibility to caries. Recent observations suggest that various trace elements in

addition to fluoride that may not be essential for general health and reproduction may play an important part in the formation and calcification of teeth that are highly resistant to caries.

*Harvard School of Dental Medicine, Boston, Mass.*



### Public health dentistry

#### Social dentistry in Italy

O. Tempestini. *Internat.D.J.* 7:189-208  
June 1957

In the past decade in Italy great progress has been made in providing dental services for workers and their families. Today, 70 per cent of the population are entitled to dental treatment through various institutes.

A school dental service, which began to develop in 1910, has been organized in many major cities. In Milan school dental service is provided in 44 schools by 14 dentists. In 1955, 33,034 children were examined in Milan. School dental service in Rome is provided by 15 dentists in 18 surgeries. In 1955, 86,715 children were examined, and 39,973 treatments were given. In Trieste treatment is given in ten surgeries of the school dental service. In Turin, Genoa, Bologna, Cagliari, Sasson, Florence, Palermo, Messina, Perugia, Bari, Padova, Pisa, Biella and Alessandria, school dental services have been maintained for several years.

The public health service started in Italy in 1930. The National Institute of Health Assistance (I.N.A.M.) was established in the early 1940's for workers in several industries and categories, including industrial, commercial, agricultural, insurance, banking, domestic service and so forth. The service is given at the expense of the Institute through its own dentists. In 1956 the I.N.A.M. assisted 19,500,000 persons.

Other assistance institutions which have been established include the following:

1. The Casse Territoriali Marittime, at Trieste, Genoa and Naples. These institutes for maritime

workers provide health services at the expense of the employer.

2. Ente Previdenz Dipendenti Enti Pubblici (E.N.P.D.E.P.). About 429,000 employees of the public services received assistance indirectly in 1956 through this group.

3. Ente Nazionale Previdenz Assistenza Dipendenti Statali (E.N.P.A.S.). This provides for state employees, the cost of treatment being borne partly by the employee and partly by the state. The number of treated persons in 1956 was 3,673,000.

4. Istituto Nazionale Assistenza Dipendenti Enti Locali (I.N.A.D.E.L.). For employees of municipalities, provinces and public assistance and beneficence institutions, this institute had 855,000 insured persons in 1956.

5. Istituto Nazionale Previdenza Sociale (I.N.P.S.). This institute provides treatment for tubercular patients. Dental treatment, and dentures when necessary are provided for all patients admitted to the 57 sanatoria and in 677 homes. In 1952 the number of persons assisted was 65,441.

6. Istituto Nazionale Assistenza Infortuni sul Lavoro (I.N.A.I.L.). This institute for those injured at work is open to all workers in public and private concerns, with treatment at the expense of the employer.

7. Cassa Mutua Lavoratori Diretti. This group provides health care for agricultural workers, the cost being shared by the worker and the state.

Different methods of treatment and different standards prevail at the various institutes. The two major institutes (I.N.A.M. and E.N.P.A.S.) provide dental treatment directly to about 24,000,000 persons.

The public and school dental services must be better organized in Italy, however. A general plan of reform is required for the present public health system. Only small percentages of those covered by health insurance are able to make use of dental treatment. The assisted person often does not have the option of choosing his own dentist. Often, to receive dental treatment he must attend excessively crowded surgeries, or travel far from home. There is a shortage of dentists, a lack of uniformity in treatment, and inequality of treatment for the various social



classes. No dental treatment is available in some of the smaller towns, except that which can be performed by the local physician. Public health services for the poorer class are not provided at the expense of the state but must be paid for by the communes, which often are unable to finance such services.

*Dental Clinic and Dental School, University of Catania, Catania, Italy*

### **Dental health [of American Indians]**

*Health Serv.Am.Indians No. 531:153-158, 1957*

The dental health services rendered to Indians in the United States have grown over the years. In 1913 the Bureau of Indian Affairs employed five dentists; in 1956, 52 dentists and 48 auxiliary dental personnel were on duty. Of the more than 300,000 Indians who are potential beneficiaries of this program, about 140,000 are 18 years old or younger.

The prevalence of dental diseases in the Indian population is of the same general magnitude as in the non-Indian population, but because of isolation, poverty and the lack of availability of dental services, the Indians do not receive sufficient care to maintain an adequate level of dental health.

Until 1951, only extractions and emergency dental services were provided. In 1951 the program was redirected toward the ultimate goal of providing complete dental services for children. In 1952, a topical fluoride program was instituted.

Only 20 per cent of the clinical needs of the patients seen in clinics are being met, and in 1956 only about a fourth of all beneficiaries (child and adult) were seen by dentists. The unmet dental need in the Indian population is so great that in many areas it is possible to provide only emer-

gency care, and beneficiaries in some areas receive no service.

Facilities and equipment are inadequate. Dental services are provided in about 275 different locations, in over 200 of which the dentists use portable equipment transported to the location. In the 52 locations with permanent installations, equipment and space are inadequate.

Several measures are proposed to improve and expand the dental program. All school children in at least the first three grades of school should be provided with dental service to meet the accumulated need for extractions and fillings in permanent teeth. About 22,000 children would require treatment the first year. The need of adult Indians for complete dentures should be met. The use of topical fluoride teams should be expanded. Water supplies of boarding schools and agencies having a continuous resident child population should be fluoridated where possible. Dental health education should be expanded. Indian girls should be trained as dental assistants to work in the Indian dental health program. The use of portable dental chairs and equipment should be discouraged. Mobile dental units are suggested for use where terrain permits. Suitable housing for employees should be provided.

A minimum of 40 dentists would be required the first year to care for the accumulated neglect in the teeth of children in the first three grades of school. About 22 dentists would be needed to provide denture services, plus about 25 laboratory personnel. When added to the current staff of between 60 and 70 clinicians, the total complement of about 130 clinicians and 195 assistants would be adequate to provide emergency care, needed extractions before dentures can be placed, and some treatments for periodontal disease. An annual budget of at least three million dollars should be available, plus funds for developing facilities.

*Public Health Service, Washington 25, D.C.*



# Doctoral and Masters' dissertations



*In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.*

A gnatho-thesiometric study of various mandibular positions in individuals with normal and abnormal function of the temporomandibular joints. *Biasi J. Addiego*. 1957. M.S.D. Northwestern University.

A method study of the Northwestern stereoccephalometer. *Herbert L. Bloom*. 1957. M.S.D. Northwestern University.

Histological changes of the contiguous structures of the oral cavity after the use of the Cavitron. *Charles B. Brown*. 1957. M.S.D. Northwestern University.

The value of the twelve-hour disk sensitivity test to the management of infections of the face, neck, and oral cavity. *Tyler C. Folsom*. 1957. M.S.D. Northwestern University.

A comparative study of movement of mandible as recorded by cephalometric radiography and the gnatho-thesiometer. *William J. Bryan*. 1957. M.S.D. Northwestern University.

A radiographic study of the temporomandibular joint in children possessing a severe sagittal maxillary-mandibular dysplasia. *John B. Hazle*. 1957. M.S.D. Northwestern University.

An electromyographic and cephalometric roentgenographic study of the mandible and the interocclusal clearance. *Alexander J. Javois*. 1957. M.S.D. Northwestern University.

An electromyographic study of postural position of the mandible. *Ronald Perry Mullen*. 1957. M.S.D. Northwestern University.

A cephalometric radiographic study of maxillary structures in unilateral cleft palate children. *Stanley Pastor*. 1957. M.S.D. Northwestern University.

A radiographic and nasometric study of the nasopharyngeal efficiency in non-cleft individuals during the production of certain speech sounds. *Edmond L. Senty*. 1957. M.S.D. Northwestern University.

A cephalometric radiographic study of the hyoid bone in relation to the mandible in various functional positions. *John L. Smith*. 1957. M.S.D. Northwestern University.

A comparison of the gnatho-thesiometer with lateral cephalometric and temporomandibular joint radiographs in measuring certain anteroposterior positions of the mandible. *Robert G. Yahr*. 1957. M.S.D. Northwestern University.

An evaluation of the changes due to growth from the deciduous denture to the mixed denture. *Leander Richard Jennings*. 1957. M.S.D. Indiana University.

A bacteriological study of the contamination of contra-angles and sterilizing procedures. *Adath Josefa Aponte-Rivera*. 1957. M.S. University of Michigan.

A preliminary investigation of discussion and clinical observation of periods embodied in a dental technic course. *Harvey W. Schield*. 1955. M.S. University of Michigan.

A radiographic study of the eruption of the permanent mandibular cuspids, bicuspid, and molars. *Donald B. Shumaker*. 1957. M.S. University of Michigan.

A serial study of the dentition and apical base relationships. *Steve T. Loper*. 1957. M.S. University of Michigan.

A statistical evaluation of the comparative accuracy of filling root canals with gutta-percha and a combination of silver point with gutta-percha. *Melvyn Eder*. 1957. M.S. *University of Michigan*.

A study of the morphology of the nasal capsular region in cleft palate embryos. *James D. Happle*. 1957. M.S. *University of Michigan*.

Methods for casting Vitallium: detection of casting defects (Überprüfung von Vitalliumgussmethoden auf Fehler). *Günther Gorlt*. 1956. DR.MED.DENT. *University of Halle/Saale, Germany*.

Representation of the human masticatory apparatus by cinematography (Die Darstellung des menschlichen Kauvorganges mit Hilfe einer kinematographischen Methode). *Eberhard Reumuth*. 1956. DR.MED.DENT. *University of Halle/Saale, Germany*.

Clinical and histologic comparison between purulent coronal pulpitis and chronic ulcerative pulpitis (Klinischer und histologischer Vergleich der Pulpitis purulenta coronalis und der Pulpitis ulcerosa chronica). *Rolf Wiesner*. 1956. DR.MED.DENT. *University of Halle/Saale, Germany*.

Indication and evaluation of Hromatka's closed-mouth impression technic (Indikation und Bewertung des Schluckabdruckes nach Hromatka). *Dieter Born*. 1956. DR.MED.DENT. *University of Halle/Saale, Germany*.

Vacuolar degeneration of odontoblasts and its biologic consequences (Vakuolige Degeneration der Odontoblasten und ihre biologischen Auswirkungen). *Jutta Deichmann*. 1956. DR.MED.DENT. *University of Halle/Saale, Germany*.

Tooth pastes marketed in the East German Democratic Republic (Die Zahnpasten der Deutschen Demokratischen Republik). *Almuth Cramer*. 1956. DR.MED.DENT. *University of Halle/Saale, Germany*.

Applicability of extraoral splints in fractures of the lower jaw (Zur Beurteilung der äusseren

Knochenheilung bei Unterkieferfrakturen). *Werner Oertel*. 1956. DR.MED.DENT. *University of Halle/Saale, Germany*.

Morphologic examination of the dentition for the determination of transversal angles of inclination of masticatory surfaces (Morphologische Gebissuntersuchungen zur Bestimmung transversaler Neigungswinkel der Kauflächen). *Wolfgang Müller*. 1957. DR.MED.DENT. *University of Halle/Saale, Germany*.

Alloplastic lower dentures: a clinical and historical study (Alloplastischer Unterkieferersatz: eine klinische und historische Studie). *Albrecht Schönberger*. 1957. DR.MED.DENT. *University of Halle/Saale, Germany*.

Resorption of an analgesic agent after intramuscular, submucosal and subcutaneous injections (Zur Frage der Resorption eines Analgetikums bei intramuskulärer, submuköser und subcutaner Injektion). *Gunther Diez*. 1956. DR.MED.DENT. *University of Marburg/Lahn, Germany*.

The preservation of the vitality of the pulp by indirect capping of the pulp with zinc oxide-eugenol (Über die Lebenserhaltung der Pulpa durch indirekte Überkappung der Pulpa mit Zinkoxyd-Eugenol). *Ilse Wegenerverehel-Schoof*. 1955. DR.MED.DENT. *University of Kiel, Germany*.

Statics and kinematics of upper free-end dentures (Zur Statik und Kinematik der Freidendprothesen des Oberkiefers). *Hans Schneider*. 1954. DR.MED.DENT. *University of Würzburg, Germany*.

Heterotopic enlarged sebaceous glands in the mucosa of the lips, cheeks and gingiva: Fordyce's disease (Die heterotopen vergrößerten Talgdrüsen der Lippen-, Wangen- und Gaumenschleimhaut: Fordycescher Zustand). *Brigitte Schober*. 1954. DR.MED.DENT. *University of Würzburg, Germany*.

Resistance of the capillaries to streptomycin (Capillar-Resistenz unter Streptomycin). *Walter Grob*. 1954. DR.MED.DENT. *University of Würzburg, Germany*.

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